

ITEMS OF INTEREST.

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Thoughts from the Profession.

AMALGAM AND RUBBER POISONING.

It has been my high privilege to have as patients some notable physicians of both schools. Their attacks have been not only against amalgam, but gutta-percha and rubber plates.

One homeopathic practitioner I pleased by putting in large, all gold fillings, against my judgment; for he was over 65 years of age, and had few teeth remaining. To have much satisfaction on so few teeth was too much to expect. The strain was so great, that the most of these fillings were lost, and I refused to use gold any longer. He left me and went to some one who would not use alloy.

Failing at that, he again returned. I refused to operate unless I could do as I pleased. He consented with reluctance, so prejudiced was he against mercurial mixtures. At the first visit I placed in several very large contour amalgam fillings. At the next visit he was furious, too mad but to curse.

“ What is the trouble, Doctor ? ”

“ Oh, these d——d amalgam fillings you put in for me ; I want them out ! I will have no more such ! ”

“ Give me your reason, please, for your change toward my friend—amalgam ? ”

“ Well, while I was eating my dinner, my fork struck one of them, and it shocked me so much I did not know but my head was coming off ! ”

“ Is that all you can urge ? ”

“ Yes, and that is enough ; I will have no more of such stuff.”

“ Now, my dear Doctor, let me enlighten you on a little subject with which every school boy is familiar in this day of electricity.

You took for granted, in your ignorance of galvanism, that it was because it had mercury in it, and you would be poisoned ; presuming still further that had the filling been made of gold no such result could occur. Now, my good sir, had an angel dropped down from heaven, and filled your teeth with gold from the streets of the New Jerusalem, and you had put your fork so far in your mouth as to touch it, you would have received a similar shock. Had you been posted on the simple law of the contact of dissimilar metals, in the presence of a fluid, such as saliva, you would have known what every child has done with a plate of zinc on one side of the tongue and a silver or copper piece on the other—a galvanic shock occurs, and even an apparent spark. If I had filled your teeth with gold, the same effect would have followed."

He soon saw the law of homeopathic similars would not work with metals. It was diametrically opposite.

"Did I fill any more with alloy?"

Be sure I did ! I was not going to let so strong an argument pass in favor of my alloy. He ever after gave up to me.

The same gentleman's wife had to have a partial upper and lower set of bicuspid and molars, which had been lost long before. He had always condemned rubber plates. It was immaterial to me, whether gold or vulcanite was used. I recommended the latter, when he at once consented to allow me to do as I pleased.

When I made the partial lower, I placed into the circle on the lingual surface a strip of platinized gold to stiffen it. This at several points emerged to the surface, and would, if possible, produce constant galvanic action between the rubber and it.

I took no extra precautions to have the rubber plates made. They were placed into a mouth that had gold, amalgam and oxy-phosphate fillings, with a saliva by no means pure.

Ten years have now passed, and at no time have I heard any complaint against plates that fitted as if grown to the manor. Even in his own mouth, I made a gold plate and English pink rubber attachments, and no poisoning or unpleasantness resulted.

SECOND CASE.—A homeopathic M.D. had met with a serious mishap to an upper central, which had lately been pivoted with a plate-tooth with a gold pin soldered to it ; gutta-percha acting as the medium. The celebrated dentist who did it, fractured the root through its whole axis from the buccal to palatal surfaces. He came to me at once for advice.

This same gentleman had often told my patients, when at his office, not to let Bonwill use amalgam. I always sent him returned word : If you know more about such work than I, fill them yourself.

I was amazed to learn the cause of his visit. I said:

"Doctor, you certainly are in the wrong office."

"No, you are my man, and it is too serious a subject to joke over."

I examined, and informed him I would attempt its further preservation, if I could be allowed to do as I pleased.

He demurred when I said amalgam would be the soft solder I would use to unite the broken sections. I told him he could have several days to think it over. After conversing as to its virtues, he granted me the high privilege of carrying my point.

It was one of those cases that a band would not avail, even if it could have been placed on without irritating the gums. The case was perplexing, as the former operator had made a pin large enough in diameter for a chimpanze's incisor and cut away too much of the interior structure.

I simply pressed the two pieces together for a day, and dove-tailed one-half the length of the root on either side and packed wholly with my special alloy; using the bibulous paper to make it as solid as possible to the very apex.

The next day I drilled through my alloy for a small pivot, and as I had none of my all-porcelain crowns, I used a plate-tooth with gold pivot. This was secured by gutta-percha, using as small a surplus as possible, so that considerable force could not again split it. Eleven years this has stood the test of a deep overbite.

To further test his faith in me and the alloy, I had soon after to replace several gold fillings, one very large. Of course I used alloy; not for stubbornness nor, I trust, for want of ability; but in my judgment the work called for it. He submitted gracefully, and ever since I have been allowed to do as I pleased. The most remarkable feature of the case was, that when I sent in my bill, he sent me double the amount; and has since made presents, showing substantially how he feels.

He has found no cause to administer "similars" as an antidote. When he wants a medicine for it, it will be another dissimilar—gold pin and amalgam base.

THIRD CASE.—Doctor —, homeopathist, was for eight years my patient; his wife before marriage had also been, since 1871. For thirteen years I had her under my treatment, during which time I had filled with gold and gutta-percha—never with amalgam. For himself, gold and oxyphosphate. No annoyance came till three months before her last confinement, when a second upper left bicuspid seemed to melt away. I found the pulp so nearly exposed, I placed in pink gutta-percha. All was well till six weeks after the

birth of the child, when she was attacked with neuralgia of the left side of head and face.

Her husband believing that homeopathy could relieve any pain with such decided symptoms, dosed her again and again. Yet she had no relief. Foiled, he looked into her mouth, and found in the region affected a pink gutta-percha filling. The gum was inflamed, tooth sore to touch, etc. He jumped at once to the conclusion, and the diagnosis was certain—she was *poisoned* most decidedly.

He rushed precipitately to my office and informed me I had poisoned his wife, and that I must proceed at once to remove all gutta-percha in her teeth.

I had forgotten what I last did, and was at first at a loss what to say. He was so sure of his diagnosis that I thought he might have “a case.” I invited him to be seated, when I said :

“ My dear Doctor, you professional men have been clamoring so long about the mercury that is in amalgam, gutta-percha and rubber plates, that I want you to give me one plausible reason why it should affect the system deleteriously.” To my amazement, he said :

“ Instance the mercurial barometer ; see how the atmosphere affects it from the slightest changes in the air.”

“ My good fellow, be kind enough to stop just there. This one example of your exalted scientific ability to make you a judge of such subjects is overpowering.”

I was mortified to think so clever a fellow and companion should show his utter ignorance of one of the plainest facts in philosophy, namely: That the rise and fall of the mercury in the barometer was from the weight of the air—merely a mechanical or dynamic effect—and not from any chemical effect of the mercury. I told him to go home and take up the first principles of Comstock’s Philosophy and Silliman’s Chemistry, and become master of them before assuming I had poisoned his wife. I further said : “ If such is a fact, then a column of water or molasses that is thirty-two feet high in a tube would do the same thing.”

I went soon to see his wife; without her telling me a single symptom, I not only pointed out the affected tooth and told the cause, but minutely described her feelings and prognosticated immediate relief as soon as the temporary stopping of pink gutta-percha was removed. It was a nearly devitalized pulp, where heat increases and cold decreases the paroxysms. I further said : “ The removal of the gutta-percha will relieve the pain by allowing gas to escape; then as soon as the pulp has been removed, I will insert similar stopping, after closing the canal with cotton and creosote.”

The husband demurred, declaring I should remove every gutta-percha filling; some of which had been in for eight years, or more, and never had given any trouble.

I refused to submit to such ignorance and prejudice; and sooner than do as bidden, he would have to take the case entirely from my charge.

The wife spoke up and declared she would submit only to my judgment. Her father, one of the most noted homeopaths of the world, she said, had allowed me to put in amalgam and gutta-percha by the pound in the teeth of the rest of the family, and no injury ever followed. So she decided to let me do as I pleased, and she would take the consequences. The next day I treated the root and filled with pink gutta-percha, and not a spasm has ever resulted. The other gutta-percha fillings remain as before.

While I was fighting this battle, I asked the doctor to send me one case where a rubber plate had ever poisoned any of his patients. He gave me the address of one that both he and his father-in-law had treated for mercurial poisoning for several years, without avail. I was to have entire control of the case till given up.

She came. Her mouth was surely in a deplorable condition. She had four artificial incisors on a rubber plate which extended at least an inch too far back, pressing on the soft tissue. The lower incisors were completely imbedded in calcareous deposit of a prehistoric age. Whenever the plate had been removed and again inserted, it nauseated for several hours following, and even then she felt an unaccountable exhaustion. There was a constant taste of copper.

I was not long in deciding what to do, with the full prognosis of complete success assured. I simply cleansed all her remaining teeth; took a plaster impression and placed in another well vulcanized rubber plate, which fitted thoroughly and did not intrude on the soft palate. From the moment she placed it in the mouth, trouble ceased.

This was so sore a defeat for the doctor, that though he had before been my very good friend, he now turned to be my enemy, and went to another dentist "who did not use amalgam"—(yet this same dentist was extravagant in its use). The wife remained with me.

These have been my most provoking cases. I am frank to say that in all my fights for this poor, persecuted amalgam and this much abused rubber, I have yet to find one mouth that has ever been unpleasantly affected in the least, and scarcely a day passes that I am not reminded of mercurial poisoning by some patient

who has just left some one of those renowned gentlemen who never use amalgam, or rubber plates—only gold—and if they had honestly done their duty the patients would not have fallen into my hands by the score.

In talking with one of our most noted operators, in extracting teeth alone, he informed me that there were two dentists in Philadelphia whose patients, when sent to him, gave him more trouble to remove the root than all the other dentists' cases in the city.

In the first place, we have very few patients from them for extraction. When they do come, it is evident, from the remains of the crown, that every means has been exhausted to save the tooth and remaining teeth; and so little remains to grasp that we are much annoyed at the prospect.

I said, "please tell me who the dentists are?" "Flagg and yourself." This answer coming from an operator in extracting alone, who has kept a high-toned office and above reproach from his wholesale slaughter, from which he often recoils but circumstances control, I feel highly honored by being thus associated with one who has been so maligned for his advocacy of "plastics."

While homeopaths have been so firm against amalgam and mercury, the old school have not been free from the same prejudice.

I speak with all deference, for my father was a graduate of the University of Pennsylvania, and I was born and cradled in medicine until I was sixteen, and have spent much time in the Jefferson College. Among my patients are many eminent practitioners who, at first, fearing the use of amalgam in their own mouths, have yielded to my judgment, founded on long experience and a constant study and practical work that should entitle my opinion to be of some value. Many have been the cases where I have seen amalgam in the teeth of patients coming from men who had placed it their without their knowledge.

When men make remarks in society meetings, "that all men falling away from manipulative ability will lean on plastic materials," it is time for us to speak plainly; for they imply that our use of plastics is a proof of our failure in manipulating gold, which is not a fact.

Dr. W. G. A. Bonwill, Philadelphia.

What would you think of a physician who should advertise, "The best prescriptions, fifty cents; not so good, fifteen cents;" a lawyer advertising, "Good opinions, \$9.00; cheapest, \$5.00;" or a preacher, if he were to advertise, "Sermons, \$5.00, and where two are taken on the same Sunday, no extra charge for Sunday-school?"

Dr. W. H. Sedgwick.

DON'T.

Our dental colleges will turn out an unusually large number of graduates in the spring, who undoubtedly expect to locate in some Canaan of promise and build up a dental practice. It shows push and pluck for a young man to strike out for himself, much more so than to buy out a practice or partnership. We all, who have tried it, know it requires many things besides a sheep-skin to successfully conduct a dental practice. I will give a few points, many of which I have learned from sad experience, so that others may profit by my errors and losses.

Don't neglect your business.

Don't misrepresent anything to get business.

Don't try to economize by using cheap material or poor instruments.

Don't make any promises, either financial or professional, that you cannot fulfil.

Don't lock your office during office hours to go off on a frolic, or to attend to any side show, or for any other purpose that can be avoided.

Don't try to tear down a competitor's reputation on which to build your own; it makes a rotten foundation.

Don't forget that the poor have feeling, as well as the rich, and are just as deserving of respect and of your best services.

Don't be cross to the little ones; some day they will be men and women, and they will remember you for good or for bad.

Don't fail to take several good dental journals, and to keep yourself posted on all new instruments and improvements.

Don't buy a bill of goods because they are cheap, or you can get time on them. Do a cash business, and be a cash customer to every one. It will wonderfully enhance your reputation in the community.

Don't repeat some slanderous story that may have been told you by talkative patients while operating for them.

Don't let a "good enough job" go out of your office; do your very best every time for every patient. By this means you will improve your work, improve your patronage, and improve your bank account.

Don't fail to be prompt in collecting and paying your bills, if from any cause you feel obliged to give or receive credit. By so doing you will gain and keep the confidence of all.

Don't use tobacco in any form; it is certainly of no benefit to you, and to say the least will work you harm physically, morally, and financially.

Don't use intoxicating liquors, for intemperance is the rock on which many a good dental practice has been stranded, and any indulgence leads to excess.

Don't forget there will come a time when your eyes will grow dim, and your hand lose its cunning. It is when you are young, healthy and prosperous that you should lay aside something to fall back on in sickness and old age, and when you will be glad to be able to reflect that you are leaving a busy, bustling world better for the part you have played in it. A serene, satisfied old age, well provided for, must be delightful.

Dr. William H. Steele, Forrest City, Iowa.

A MOTOR FOR THE DENTAL OFFICE.

EDITOR ITEMS:—I am astonished at Dr. W. C. Barrett's declaration in his article in April (*Western Dental Journal* for 1890), in which he says: "The crying need among dental operators is for a motor which shall be sufficient for his needs; that electricity does not answer," etc. I say I am *surprised* at this declaration of the doctor, a man of his advanced idea and standing, at this day of multitudinous motors. Evidently he has not investigated this subject deeply.

If the doctor could step around into my little office some morning it would afford me the greatest pleasure to show him an electrical plant (storage battery) that I have had in steady, active, uninterrupted daily use for the last twenty-eight months, at a cost of only \$1.50 per month. The entire expense for repairs and acid have not exceeded \$5.00, and probably \$3.00 would cover it. The daily attention required is less than the oiling of a dental engine.

I have the plant so arranged as to run one-eighth horse motor for lathe and a small Philadelphia motor for my dental engine, a Bonwill plugger, and a small electric mouth lamp.

It is so arranged that I can use either independently or all at the same moment, without interfering with each other in the least.

The whole plant cost considerable less than a good work horse would have done, and has cost vastly less to feed it and take care of it, and is *always* ready night and day to respond instantly to the touch of a button.

It is the most reliable, indefatigable assistant I have ever had any experience with. It is a faithful, ever ready and obedient servant.

Therefore, I must differ from the doctor when he says electricity does not answer our needs as a dental motor.

ANOTHER ITEM:—Those who work aluminum doubtless experience difficulty in burnishing through a persistent tendency of the burnisher to scratch the surface and prevent a perfect finish.

On some pieces I have found it simply impossible to touch the metal anywhere or in any way without scratching it at nearly every stroke of the burnisher.

There is no one step in the course of the construction of a plate of this metal, with the single exception of contamination with other metals, which is so conducive to its durability as a complete and perfect burnished surface. The surface should be burnished down to a hard glassy surface, then it is capable of resisting the action of the disintegrating forces which are brought to bear on it in the mouth.

To accomplish this result easily and thoroughly after the piece has been finished thoroughly with Scotch stone, pumice stone and chalk until the surface is perfectly smooth and *clean*, cover the surface with a few drops of olive oil and burnish with any smooth steel burnisher as quickly and thoroughly as desired, then cleanse it of the oil, washing with soap, and burnish again, after which use *rouge* with buff cone or chamois skin.

F. W. Blomiley, D.D.S., Sioux Falls, S. D.

ROOT FILLING.

Discussion in Chicago Dental Society, abridged.

Dr. Louis Ottofy: I do not think there is any operation within the range of dentistry that requires as much care to be decided, whether it should be performed or not, as that of immediate root filling. I do not stand here to advocate it or to defend it, or to claim that I generally practice it. But about the time when so much was said as to what could be done about filling roots immediately,

filled in the neighborhood of fifty or seventy-five, regardless of the condition in which they were at the time they came to me. Out of this number there were only three, if I remember rightly, that gave serious trouble, or in which the fillings had to be taken out. [Unless they were taken to other dentists.—ED. ITEMS.] I do not think roots are filled at any time in this way without giving some trouble. The patients generally agree in claiming that an inflammation of perhaps from six to ten hours' duration usually follows the filling of a root. Since then I have only practised it occasionally in cases in which there were special reasons why the root should be filled immediately. I do not think immediate root filling pays, as a general rule. It does not pay because the patient

does not appreciate it as well as if the root had been treated a number of times ; and it does not pay because it causes inflammation. I believe, for a root to be filled immediately, it is essential that the canal should be well cleansed. Those who are in the habit of using root filling materials without any medicament ought not to practice immediate root filling. If a root is thoroughly cleansed, and then filled with eucalyptol, and iodoform pumped in, and this covered with gutta-percha, in all probability some of the drug must remain there. Some think the presence of the drug is detrimental to the filling. Perhaps it will take many years to determine that point. There is no doubt but what some of the drug must remain when the root has been thoroughly saturated with eucalyptol and as much iodoform pumped into it as possible, then the eucalyptol being dried out and more iodoform pumped in. I think the success of immediate root filling somewhat depends on the efficacy of the drug at the apex of the root, placed there to prevent further trouble. Iodoform can be found at this point a long time after it has been introduced, whether it remains there all the time, or is absorbed, or passes through the apex of the root, I do not know.

When pain or bleeding occurs, it is impossible to fill a root immediately. When the pulp is dead, or has been dead for years, and there is no pain or inflammation, I believe the root can be cleansed and filled at one sitting. It takes an hour to an hour and a half to do it properly, and the patient does not appreciate it as well as if he were given to understand that the operation requires to be repeated at some subsequent sitting. Where there is a peridental inflammation, or the patient complains of pain at the time he presents himself, I think such a case not suitable for immediate root filling. It is my opinion, judging from what I have seen of these cases, though I do not practice in that way, that 75 per cent of the roots at the present time could be filled immediately. If eucalyptol and iodoform can be placed into the root, and a gutta-percha filling put over them, and the tooth remains in good condition when thus perfectly sealed, there is no reason why the root may not just as well be filled with gutta-percha, provided some eucalyptol and iodoform remains at the apex as to fill it temporarily, and fill it permanently at a second sitting. I have only practised root filling since three years ago in cases where there were reasons sufficient to do so—as, for instance, the patient lived too far from my office, or would not be willing to go to the expense of having it treated from time to time. At the time this question was up for discussion I had in a few cases of serious inflammation, and in one or two I had to remove the filling. As has been said, inflammation of

from six to ten hours' duration follows invariably. In those in which the inflammation was marked, I took special pains to have them come back. I have seen several within the last two or three years, and they are in good condition.

Dr. Geo. H. Cushing: Dr. Boedeker, of New York, who was one of the most thorough investigators in such subjects, made sections of teeth filled with dissolved gutta-percha, and gave his adherence to that material as the best for the purpose, because he found in many cases it absolutely penetrated the dental tubuli. That was good evidence that it was penetrating material, and experiments of my own have convinced me that it will go through canals smaller than can be discovered except with the microscope. I do not think the objection to its going through the end of the root is a serious one by any means. From my experience I have never known any persistent trouble to arise from that. I have no question that every time a root is filled with dissolved gutta-percha the material goes through the foramen, if the root is perfectly filled; and sometimes, if it is pumped through with great force, or is pressed more tightly than it should be, it will set up irritation which will continue possibly for some days. I do not know but I have known the irritation to continue for two or three days, but it usually yields to very simple treatment. With ordinary care in stopping the packing at the moment that the patient begins to feel it being pressed through, I think there will be very little trouble of that kind.

Where the root is irregular or the foramen very small, the gutta-percha must be preëminently the best thing we can use. I do not believe it is possible that any cements can be packed through these fine canals with certainty; but gutta-percha can be used with greater certainty of its reaching the apical foramen than any other material. That is the point we want to hermetically seal, if possible. If we have that sealed we do not care so much about the remainder of the canal.

With regard to the operation of immediate root filling, I am not able to perform that operation without having trouble. I have tried at times, during quite a number of years, and they have always failed, so that I abandoned the practice as unsafe. Some dentists have great success in certain methods of practice, while others fail, owing to a lack of ability probably of one and the superior ability of the other. Be that as it may, we know it to be a fact that some individuals have remarkable success in some operations that others cannot equal. I am one of those that cannot meet with success in such operations. I do not deem it theoreti-

cally sound practice, I think there are strong grounds against it. There is not much room for discussion.

If the root is in a thoroughly aseptic condition, we may fill it; there is no question about that. But how do we know it is in that condition? There is the great trouble. It is better to be a little more conservative and not attempt heroic treatment; it is a safer way.

Dr. Mullet, of Clinton, Iowa: I am greatly interested in the discussion, and I have wondered why no one mentioned peroxid or hydrogen in connection with root filling. I remember a few years ago when I was in Chicago, through the kindness of a member of this society I was invited to attend a meeting. At that time some of you were using peroxid of hydrogen and recommending it, and from that recommendation I became accustomed to its use and have continued to use it up to the present time. When one of the essayists—the first one I believe—spoke of putting fibres of cotton and leaving them in the canal for a week or more to absorb the débris or any remnant of the pulp, I thought of peroxid of hydrogen, that in many cases it would succeed much better than the fibres of cotton thrust into the root canal.

As to immediate root filling, I have had the temerity, audacity, or lack of caution, whatever you may term it, to do that in a good many cases. With four years in filling the roots of teeth I have not had to extract one. This may seem to you like boasting, but it is nevertheless a fact. In one case where abscess occurred, I was asked to go to the lady's house to extract the tooth, but when I got there a change for the better occurred, and we left it in, and it is doing good service. That was two years ago. As Dr. Ottofy says, I think it is wise to select the cases carefully on which to practice immediate root filling. I apprehend that a great deal of our trouble about filling roots of teeth is in the lack of thoroughness of manipulation, not whether it is possible or wise to fill it today or next week, but to get it absolutely free from the remnants of the dead pulp or débris it may contain should be our object, disinfecting it thoroughly and filling it thoroughly.

Dr. J. G. Reid: I wish to say in reference to immediate root filling, that it is in exceptional cases that I would practice that method. There are occasionally patients who do not keep their appointments regularly, and to get satisfaction and to get even with them I like to fill the roots of such people immediately.

I have had success with gutta-percha, and am willing to let good enough alone. I have not found anything better, easier, or more economical than gutta-percha, hence it is my universal practice

to use it for filling root canals, and my methods do not differ from those who have spoken on that subject. I always endeavor to treat the tooth, cleanse it as well as I possibly can, and I believe the greatest success depends on getting the root thoroughly dry, and when the gutta-percha is introduced we have a filling that is impermeable to the ingress of anything. I believe if there is any moisture in the pulp canal when filled there is a possibility that the filling will be imperfect, but otherwise I do not want anything better than gutta-percha.

DR. A. W. HARLAN: It has been said that physiology is the romance of medicine, and for me the subject of treatment of abscesses and the filling of roots of teeth is the romance of dentistry. I do not care anything about making crowns, or artificial teeth, or regulating appliances—anywhere near as much as I do about the treatment of disease around the roots of teeth and the filling of them.

Now, the philosophy of root filling is what we are trying to arrive at, and I believe that is tolerably well understood. The object is to remove foreign matters from the roots of teeth, and if the substance of the interior of the tooth is infected that should be disinfected and the root filled, the end being hermetically sealed, if possible. If there be disease of the bony structures surrounding the roots of teeth, this can be operated on surgically and be treated like any surgical wound.

Now, with reference to the subject of immediate root filling. The science of economics steps in at once. From the pure aspect of economy it does not pay to fill the roots of teeth immediately, even if you look at it from any other standpoint, because if you have three people out of one hundred with failures you will spend more time in caring for these three in coming to your office, losing sleep, and interrupting you during the duties of the day, than you would have if you had spread it over a longer time and used the medicants that ought to be used in trying to disinfect the infected dentine. A great many gentlemen in thinking and talking about this subject, when they get on their feet lose sight of the fact that the living membrane surrounding the root of a tooth is liable in the course of time to be enfeebled and to absolutely disappear from the surface of the root, if the dentine adjacent to the cementum is polluted with mephitic gases; after that is disinfected and removed and the tooth rendered sweet, then filled after being properly dried, the periodontal membrane will not be enfeebled except from the ordinary physical wear and tear of mastication. It takes a good many years to wear down a tooth of that kind.

There are many of you who have seen specimens of alveolar ulceration. My definition of alveolar ulcerations is, ulceration of the periodental membrane, not beginning at the apex of the root, but perhaps along the side somewhere, due in many instances to imperfect disinfection of dentine and imperfect root filling through the length of the root. Perhaps some of you have never noticed that very much, or if you have noticed it you passed it by with little thought. There are many teeth that are tender to touch, little miserable teeth, bothering their possessors all the time, due to that cause, in my opinion.

Professor Miller, in an article a little while ago in *The Dental Cosmos*, said that those gentlemen who thought dentine could absorb gases, if they were afraid of that, they should fill the interior of the root with charcoal. Now, that is a foolish suggestion, it seems to me, to be made by a scientific man, because he knows those delicate canals cannot be filled with an absorbent of that kind. It would have been far better and much more instructive to the reading public for him to have said that, though it had not yet been proven positively that the dentine could be thoroughly permeated by phosphoretted and sulphuretted hydrogen, yet an attempt should be made to render that non-poisonous, and then a suitable root-filling could be introduced; because there are a lot of people who run after everything with which they can stuff into the roots of teeth. The amount of charcoal that can be put into the root of a tooth beyond the pulp chamber would be so slight that the condition I spoke of would be brought about—enfeeblement of the cementum and pericementum and a permanent lameness of the tooth. I do hope most sincerely that those who fill the roots of teeth to-morrow will put in the fillings in the best possible manner, and that if they do it with wood, they will press it so hard as to be sure that it is filled to the apex. There is no amount of discomfort so great as that experienced by a patient who has an imperfectly filled root, or one that is filled before it ought to be. Every man should be as thorough as possible, though crowded for time. What we need is a little missionary work in this respect among the best of dentists.

Dr. J. N. Crouse: Incidents in office practice come up very often in root-filling. Not long ago a gentleman came to me who had broken off the crown of a central incisor. We decided to put on a banded crown. I opened the root and found it filled with gutta-percha, oxychloride of zinc and I think with some tin-foil. The root had been previously drilled open through the apex, the opening being just as large at one end as the other. The drill

used was about as large as No. 4 shot (about No. 10 drill). Now then, this is a nice case to fill. (Laughter.) It is all well enough for you to talk about pumping gutta-percha into the tooth, but what are you going to do in such cases. I will tell you what I did. After dressing it two or three weeks, applying peroxid of hydrogen, permanganate of potash and oil of cinnamon, and the tooth still remaining uncomfortable, I commenced packing the root pretty close with carbolic acid and cotton, just dampening the cotton with carbolic acid and driving it very gently with a mallet to be sure that it got just to the end. I finally got that tooth comfortable. The next thing was to fill the end before setting the crown. I took a drill and enlarged the lower part of the molar, making it a little funnel-shaped, then I took non-cohesive gold, rolling it into a tolerably tight roll about as large as the opening of a canal, and drove, with a very little gutta-percha around it, to end of root. I heated an instrument hot, so as to warm the gutta-percha, and drove it carefully until I felt it was in place. These cases do not come along often. When I do strike one with a big opening at the end of the root, it taxes my ingenuity to fill it so that I am sure it is well filled.

There is no rule that can be laid down for these extreme cases, except good judgment thoroughly used, which will often be taxed to its utmost.

I have under my care at this time, a patient who has been in the hands of four as good dentists as there are in any city. The patient has been traveling about from place to place suffering from neuralgia and has had a great deal of work done. I have given my best energies to try to find out what the trouble is. Several of the teeth have roots filled. In those I have opened, gutta-percha has been used. I found considerable moisture at the end of the root of one of these teeth and a chronic (blind) abscess without fistulas opening, but no filling.

After working on the case and getting the patient tolerably comfortable, the neuralgia appeared on the other side of the face. I removed a posterior filling from lower molar on that side, and in lifting the gutta-percha from the pulp cavity brought with it two little strings of gutta-percha, which seemed to have extended to the end of two roots. Before removing what was in the other root I could pass a broach down the side of the filling to the end of the root.

Do you think such a filling impervious to gases and moisture?

When my broach went down to the end of this root, immediately the tooth I had been treating on the opposite side became so sore I

could not touch it. This simply shows what extreme reflex action will do.

Soon after getting the distal root open, pus filled the entire cavity. This description of recent cases will suffice for more than I could give, difficult it is true, where operations were performed by more than average operators.

I apprehend that in twenty years from now we will settle on a better material than gutta-percha for root filling. We have a better one now, I think. I have been filling the roots of teeth with both gutta-percha and oxychloride of zinc, alternating them, trying to find out which gave my patients the more comfort. I always use gold around a broach to carry either material to end of root, and also carry the gold end if possible, relying on the plastic material to occupy the space where the gold does not go, excepting where the roots are too small, and then would use thread of cotton with oxychloride of zinc. I fail to see the romance of filling roots of teeth. Romance of that character does not strike me favorably. I revel in romance, but it does not come with filling roots. I am glad we are not all alike. I am glad some people like what I do not like. I take this root filling too much to heart. There is no such joy about it to me. I like to see what I am doing. I feel better then, but the fact that we cannot see exactly what we have done makes the duty of root filling the most tedious, most unpleasant, and in proportion to the time and labor given, to me the most unsatisfactory part of my work. I apprehend that oxychloride of zinc, if properly driven to the end of a root, is one of the best things we can use as a filling material.

With regard to the experiments of the gentleman in Philadelphia, who uses carbolized cosmoline, I can see how a root might be wiped and then a filling put in, and thus get all the advantage it may possess, using it in connection with other materials.

Dr. A. E. Baldwin : I firmly believe in immediate root filling, and I can give you the grounds for my belief. In the first place, I have yet to see a tooth in or out of the mouth where, if the apical foramen of the root were perfectly filled or hermetically sealed, there would be trouble in that tooth subsequently. Now, the question is how to get that condition of things. Some dentists say they cannot succeed in immediate root filling. I believe thoroughness is of the utmost importance. The greatest care should be exercised in removing débris. I do not believe any dentist can take a pulp immediately on its being devitalized, and remove it entirely, yet I perhaps should modify that statement a little by saying that possibly it can be done in some instances. I doubt much, however,

whether it can be done in many cases. I believe one should wait a reasonable time for the separation of the dead from the living tissue, then you can remove the pulp from the recently devitalized tooth, say after an interval of from one to two weeks you can effect a perfect removal of everything in the root canals with very little trouble and almost entire absence of pain. When the roots are cleaned antisceptically or aseptically, if you are thorough in getting out the contents so that you can properly dry the roots and get the filling material to the end of the root, hermetically sealing it, you will have no further trouble with the tooth. Understand me, I do not advocate the leaving in of any *débris*.

I think Dr. Cushing demonstrated to several of us many years ago that at least it would pass through openings so small that we were unable to detect them by the naked eye. That is one of the reasons why I have been using gutta-percha. As far as the absorption of gases from the inside of the root canal by the peridental membrane is concerned, I have yet to see such a case which is clearly to me a fact. I can see no plausible reason why, if you get your root clean and dry, you should wait and not fill it immediately.

I do not think I have ever had but one case where from immediate root-filling I had subsequent trouble. I have seen within the last year three teeth where roots were filled after several treatments that I recall in memory now, where I have been called to treat abscessed conditions. One of them had been treated for months, and the root filled by a good dentist. I do not condemn the operator nor the operation, because oftentimes I think if we saw the patient at the time the other fellow saw it, we would condemn less than we do. Patients do not always do as dentists tell them. Sometimes the dentist will put in a dressing, and the patient is somewhat dilatory in coming again. In some instances they never return. I have had one or two cases where patients have come to me with dressings in their teeth, put in by other dentists. Immediate root-filling with me has been as successful as treated teeth were. We should remember that any poisonous substance, however noxious it may be, will become totally inert if thoroughly dessicated. If you get the root of a tooth thoroughly dessicated, then hermetically seal it, it is going to remain so. I have taken a tooth and filled the root at the apical foramen, and have then immersed the tooth, after sealing the top opening, in water. I have also immersed teeth in alcohol filled in this way, and I have yet to find fluid or moisture on the inside. I know the walls of a tooth are not as dry as they might be, because moisture in infinitesimal quantities will pervade any living or dead human tissue if allowed

to remain in contact, but I have yet to see one case where I could find any marked degree of moisture in the root canal. Because one dentist does not fill the roots of teeth immediately, is no reason why I should follow his example. Patients will underestimate the importance of our work by giving such erroneous reasons. I think my patients will appreciate more fully my ability to cleanse the root at the same sitting, if I can do so without trouble, than to have them make ten visits, and necessarily charge them ten times, for I do not believe that any of us should treat without expense to the patient. So I think we can epitomize the subject by stating this one thing: Each dentist should use that material which, in his hands, is the most successful in working into the root canal, and hermetically sealing it. As to the time of filling a root, as soon as you can get it dry and clean, fill it at the first or subsequent sittings.

—Dental Register.

THE USE OF PEROXID OF HYDROGEN IN DENTAL SURGERY.

I beg leave to call the attention of the dental profession to the fact that, owing to its wonderful bactericide properties, the peroxid of hydrogen is the most powerful remedy to apply to cure the dental affections which are known to be caused by germs or microbes, such as, for example:

Alveolar abscesses and abscesses of the inferior maxilla.

Laceration, inflammation and ulceration of the gums; stomatitis.

Necrosis and caries of the teeth.

The profession well know that the therapeutical agents used for the treatment of these diseases have been as follows:

Chloride of sodium, salicylic acid, chloride of zinc, nitrate of silver, creosote, and carbolic acid.

With the exception of chloride of sodium, which has no appreciable destructive action on the microbial element, the other above-mentioned remedies are poisonous, and owing to their corrosive properties, the dentists cannot always limit their action to the affected parts.

The creosote and carbolic acid have such an offensive odor that they should not be used. On the contrary, peroxid of hydrogen is absolutely harmless; it is almost odorless and tasteless.*

By the healing power of this wonderful remedy, the diseased

*It is used without danger or risk of poisoning the patient, and yet it is the strongest bactericide and purifier known.

surface is made healthy and the surrounding tissues remain in their normal condition.

ALVEOLAR ABSCESES AND ABSCESES OF THE INFERIOR MAXILLA.

TREATMENT.—The local treatment demanded is such as will destroy the accumulated pus.

At first the abscess should be broken by a surgical operation or otherwise, then the cleansing and destruction of the pus will be accomplished instantaneously, as follows:

By means of a silver, gold, or platina syringe, administer into the cavity, morning and evening, one or two injections with a mixture of

1 part peroxid of hydrogen
with 3 to 4 parts of water.

In the treatment of abscesses of the inferior maxilla, where there is no free egress for the pus and débris, much more energetic treatment is necessary, and the dentist need not hesitate to administer injections, morning and evening, with a mixture of

1 part peroxid of hydrogen (medicinal)
2 parts water.

Besides the above local treatment, the mouth should be kept clean by frequent washings with a mixture of

1 tablespoonful of peroxid of hydrogen
diluted in a half tumblerful of tepid water.*

By following this treatment the diseased tissues become healthy after one or two applications, and a cure is effected in half the ordinary time.

LACERATION, INFLAMMATION AND ULCERATION OF THE GUMS—STOMATITIS.

TREATMENT.—Peroxid of hydrogen is the most powerful remedy which may be applied to subdue these very tenacious and painful affections.

It should be used freely and repeatedly as a tooth-wash, morning and evening, in the following proportion:

1 ounce medicinal peroxid of hydrogen,
diluted with half a pint of water.

Rinse the mouth well, and retain this liquid in the mouth for one minute or so at each washing. No injurious action on the enamel of the teeth need be feared.

The gums are strengthened by this treatment, healthy granulations develop rapidly, and an absolute cure is quickly effected.

* When chronic, during four or five days, floss silk or absorbent cotton, moistened with glycozone, should be applied immediately after each cleansing of the cavity.

When these diseases of the gums are caused by constitutional derangement, internal medication would necessarily be prescribed.

NECROSIS AND CARIES OF THE TEETH.

Caries is a common cause of necrosis. Excessive medication, especially with mercury, will sometimes produce partial, and occasionally total necrosis.

The profession know that the most common agents that injure the teeth are originated in the mouth by the decomposition of animal and vegetable matter.

Inflammation of the mucous membrane of the mouth is a common result of diseased teeth.

The caries may be constitutional or local, and if constitutional, the dentist knows that it may be modified by therapeutic treatment of the general system.

In caries, the aggravation of the disease will always be prevented by using frequently and copiously, as a tooth wash, a mixture of

1 to 2 ounces peroxid of hydrogen
with a half pint of water.

Rinse the mouth well, at least morning and evening, and retain this liquid in the mouth for one minute or so at each washing.

When the caries is local, an absolute cure is promptly accomplished by the above treatment. *Dr. Charles Marchand, New York.*

WHEN TO EXTRACT.

A gentleman had some molar roots in the inferior maxilla which ulcerated and started a cellular inflammation in the tissues exterior to the jaw. He consulted his physician about the swelling, and was sent by him to me. I found that pus had formed, and had made a pocket, which was gradually approaching the skin. Immediate extraction of the roots was advised, but the patient objected to this and returned to his physician. An external opening was made and the pus evacuated, but in spite of treatment the abscess would not heal, and continued to discharge for three months. At the end of that time he came again to me, and the roots were extracted. In a week the abscess was nearly healed, and though finally a healthy condition was brought about, it left a bunch of cicatricial tissue on his lower jaw to disfigure his face.

This case illustrates fully my meaning as to a proper time to extract. The treatment followed in his case was unavoidable, because he was not willing to submit to the judgment of the dentist

but we are sometimes counseled to follow the same course purposely, as the one giving every chance to save the teeth. This is to be regretted when the unwillingness of the patient makes it necessary, and to be deplored when a dentist deliberately advises it. There was evidently a time when extraction could have been done for this gentleman that would have saved the pain and disfigurement.

It should also be said that great risk to life will sometimes be incurred by failure to act at the proper time. You will recall the case of a gentleman in Brooklyn who lost his life a few years ago from hemorrhage caused by an extensive ulceration. None of us may ever meet a case of this kind, but the chance of doing so is with us if we allow these suppurative actions to spread; and one such case would be all that any of us would care to have in the whole of our professional career.

Ordinarily a patient will take the advice of the dentist, and in cases parallel to that of the gentleman of whom I have spoken as refusing to allow the extraction, but where the patients are willing to do as they are told, the offending teeth should be removed on the first sign of trouble. Any temporary or dilatory measures, whatever the excuse made for them, would be poor judgment and worse practice.

There is still one point I wish to speak about in closing. In my own experience I have met with a difficulty in doing what seems to me wise from a direction in which it would not be expected. The presentation of cases where great swelling is present and deep seated pus-pockets, together with other disturbances, leads to the advice to have the exciting cause removed. But I am frequently met by the astonished question, "What, doctor, while it is swollen?" Inquiry reveals the fact that I am in conflict with the family physician, who has expressly ordered that the tooth must not be touched until the swelling is reduced. Of course this idea finds a ready champion in the patient who is only too glad to escape the much-dreaded forceps. Such a position is so decidedly untenable from a scientific and surgical standpoint, that I have been surprised to find that not only many physicians, but some dentists, occupy it.*

—Dr. R. M. Sanger, Orange, N. J., in *Dental Cosmos*.

A poultice made by stewing the flowers of chamomile, a garden plant, in cider vinegar, and applied hot, is an excellent disengaging and soother of local pain.

* Another reason for immediate extraction is that the tooth is more easily extracted and the operation is less painful while the severe inflammation loosens the tooth.—ED. ITEMS.

CEMENTS.

The first prime quality of the zinc phosphate, the one which is of greatest value in their employment as a filling material, is that of clinging to the tooth substance—the main characteristic of a true cement. This tenacious attachment necessarily forms a closer and better contact than is possible with any other filling material. The contact of all other materials is a mere mechanical juxtaposition which cannot be air-tight and only approximately moisture tight. Capillary attraction will draw in moisture around all mechanical fillings that depend solely on manipulation for such a contract, except, perhaps, those of the very finest workmanship, but there are few fillings that attain this ideal perfection. Then again, as moisture comes also from the tubuli of the dentine, drawn by capillary attraction, it follows that mere mechanical exclusion can never be absolute. With the oxyphosphate, however, the principle of adhesive contact, by which the filling becomes as one piece with the tooth substance to which it clings, the exclusion of moisture and the consequent prevention of caries is absolute. Not only is the external moisture perfectly excluded and capillary flow prevented, but the very orifices of the tubuli are closed and moisture even from that quarter shut out. No other materials which we use for filling possess this invaluable quality in the slightest degree, and its great value will be apparent as we describe the situations in which the cements ought to be employed.

This is apparent first in their use in lining large cavities and strengthening weak walls. For this purpose they have been in much repute, and extensive use for some years. It is a good rule in practice that all cavities, where depth will permit it at all, should have a layer of cement in the deeper portions. After preparing the cavity—leaving the softened dentine over the pulp in deep cavities—cement is carefully placed in contact with all the inside while in a sticky, clinging condition, and the cavity nearly filled with it. After hardening, the cement is cut out to sufficient depth to retain the metal filling and the margins carefully finished. In teeth of soft structure the cement lining will insure their better preservation, for it is a well-known fact that in such teeth caries filled with only metal will nearly always return. Gold cannot be condensed against the walls sufficiently well to exclude moisture, and the dentine itself is like a sponge, while amalgam, when it prevents caries at all, does it by hardening these soft tissues by impregnating them with the salts of its decomposition and consequent discoloration of the tooth. In such teeth, better preservation is insured by lining with cement

and thereby excluding moisture from all sources by absolute adhesive contact. This is accomplished by filling the cavity to the enamel margins with cement and allowing the metal to come in contact with that tissue only.

The contour of the tooth can often be preserved by filling overhangs of enamel with cement, which will strongly support such weak walls and thus reduce the size of the exposed filling. Thus the labial walls of proximate cavities in the anterior and buccal teeth should be lined with white cement to support and retain the tooth substance and give the tooth a lighter color. The corners of incisors which are weak and thin can be preserved in this way, the gold being carried around the enamel to bind it in. This makes a much more artistic operation than the old system of remorselessly cutting away all weak walls and exposing a mass of gold. In the molars also, deep overhangs can be supported with cement, and the natural face of the tooth be preserved for the more effective performance of the functions of mastication.

There are many other places also in which it can be employed to advantage, and it should be made a rule to place it under all fillings where there is sufficient depth of cavity to permit of its use. An additional reason for this is that it is a non-conductor of thermal changes, and will prevent shock to the pulp from the too near approach of metal.

The next important quality which we notice is that by some chemical action not yet understood, the dental tissues under phosphate cement in time really become harder and drier by contact with it, rendering the tooth better able to receive the impact of filling with gold, and more resistive of caries afterward. Perhaps the phosphoric acid of the cement is the very element the tooth tissues require for increase of density, or other chemical combinations are brought about which answer the same purpose.

Probably the hardening is caused by a mere saturation of the soft tissues by the cement when liquid, but whatever the cause the fact is sufficiently assured to make it a practicable working principle. For the purpose of accomplishing this hardening in very soft teeth the oxyphosphate is employed and allowed to remain for some months, and renewed when necessary.

Not only is this hardening treatment indicated in the soft and structureless teeth of many adults, but it is especially applicable for the filling of the permanent teeth during childhood and adolescence when the dental tissues are soft and immature. As we well know the teeth are much less dense and solid at eruption in childhood than after the maturity of the individual, the teeth naturally

partake of the nature of the other bony tissues and solidity during the growing years, becoming more dense as age progresses. For this reason there are few cases in which the teeth are sufficiently dense to allow of being filled with gold with any hope of permanence before puberty. Occasionally small fillings of gold can be made on the grinding surfaces in dense teeth at an early age with a prospect of durability, but rarely large fillings in any position. How often have we seen large fillings fail in the proximate surfaces when put in for children, and how seldom do they succeed! Then again we must consider the danger of subjecting children to prolonged operations. Therefore we contend that the permanent teeth should be filled with phosphate cement during childhood and adolescence that the teeth may be hardened both by nature and art, and that suffering may be saved to the blessed children. Of course, there are exceptions when small gold or amalgam fillings may be put in with safety, but it is very rare that the teeth in childhood should be filled with gold. The first molars for instance, which nearly always decay early, and sometimes the incisors, should be filled with cement and renewed when necessary till the teeth become sufficiently hard and the child becomes sufficiently strong to endure a permanent operation. As soon as possible the molars should be filled with amalgam which can remain till after full maturity, when it can be replaced with gold. And then the gratification of having the confidence and gratitude of the children by saving them suffering and keeping their teeth comfortable, is the crowning reward among the advantages of this method of treatment, to say nothing of the banishing for life of that senseless and annoying timidity regarding dental operations, which is so wearing on us and is the bane of our existence.

Then again, the durable cements are especially valuable for filling the deciduous teeth in young children. With the little three and four-year olds, perfect cleansing and preparations of the cavity are rarely practicable and often quite impossible. Cement can then be used with good results till the sensitiveness of the tooth is overcome and the confidence of the little one gained, so that a better cement filling can be made, or perhaps of amalgam. The soft and porous nature of the deciduous teeth indicate the use of cements, especially as it is always necessary to leave as much tooth substance as possible in the direction of the pulp, for this organ is certain to perish under large fillings in these teeth. Cement linings are necessary under large amalgam fillings to support the soft and frail walls and protect the pulp. When the pulp dies and the tooth becomes a shell, cement makes a better root filling than anything

else and supports the frail tooth as no other filling can. The tooth can then be finished with amalgam or crowned, for it is imperatively necessary for the child's health that the baby molars should be preserved for mastication till at least the first permanent molars are all in place. Children are better chewers than adults, for the act gives pleasure to the jaws and the habit is a valuable one to get well established for the good of the future health.

When the teeth of the aged have become soft, and often extensively carious, and when the individual is unable to endure severe or long operations, the cements are the best of filling materials. They answer an excellent purpose in the preservation of senile teeth, and are readily renewed without severity on the aged patient, when they do waste away. In some mouths they last better than in others, of course.

With invalids who cannot endure any painful or protracted operations—and whose teeth are often unfit for good fillings of metal—cement answers the best purpose for tiding over the time till the patient and the teeth are in better condition. If both do not recover, it is best to renew the cement as it may wear or dissolve away. During pregnancy and lactation it should be used also till the teeth recover their normal tone and the patient her wasted strength, for metal fillings are contra-indicated at this time.

Another important use of the cement is in the treatment of sensitive dentine as a temporary filling material. For this it is absolutely unequaled for safety and efficiency. A sensitive cavity can be filled for one or two weeks and the sensitiveness reduced so much, in most cases, as to permit of comfortable and thorough operating. Occasionally the pain persists, especially in nervous subjects or in buccal cavities, and the cement will need to be renewed, but it will pay to do this two or three times for the comfort of the patient and the safety of the pulp. Excessive sensitiveness should always be allayed, not only for the comfort of the patient, but for the safety of the tooth and pulp, for there is danger in the irritable condition of the dental tissues. If there is forced preparation and filling of the cavity when great sensitiveness exists, with or without obtundants, there is likely to be annoying after sensitiveness to thermal changes, and the constant shocking will ultimately result in congestion and death of the pulp. This is a result that occurs too often as a sequel of the forced filling of sensitive teeth, for the danger is ignored in theory and practice. It may be said that no tooth which has been filled when very sensitive, and remains tender afterward, is in a good condition or that the pulp is safe. Even if the sensitiveness is temporarily allayed by obtundants, it

will return when it recovers from the effects of the anesthetic, and the tooth will be sensible to thermal changes. Therefore, it is the best practice to permanently allay sensitiveness of the dentine, and this can be done effectively and safely by the use of zinc phosphate cement, and accomplishes this probably by the exclusion of air and other irritants, the prevention of thermal shock, the neutralizing of the product of carious fermentation, and the impregnation of the dentine by the fluid cement and subsequent hardening. The permanent operation can afterward be performed with comfort to the patient, with safety to the tooth, and satisfactory thoroughness to the operator. And last, but not the least, of the many advantages of this method of the positive reduction of sensitiveness, is the comfort the operator experiences in deliberate and thorough work without the harrassing protestations of the suffering patient. He otherwise, either consciously or unconsciously, stops short of that thoroughness which he would attain, were the operation painless. Hence it is that so many fillings that fail have a history of painful work when inserted, and we cannot but feel that they failed because the operator stopped when "it would do," and did not carry out the preparation of the cavity satisfactory to himself. And we do not blame him. On the contrary, our heart goes out to him, for we well know that he suffered also. Therefore, we claim that it is demanded by all the rules of good practice, that sensitiveness should be reduced for the comfort of the patient, the safety of the tooth, and the satisfaction of the operator, and that the best material with which to do this is phosphate cement.

It has been objected that the cements, when used for this purpose, are liable to produce death of the pulp, but it has been noticed by the writer, in an extensive use of the zinc phosphates, that such a result does not occur any more frequently than with any other temporary filling material. Devitalization does not follow except when the pulp is in such a condition as to render its death probable under any filling. Aching pulps are sometimes, though rarely, preserved alive permanently under favorable conditions in favorable organizations, and the zinc phosphates do not show a larger percentage of dead pulps than any other material. The precaution should, of course, be taken in exposure of the pulp, and even in very deep cavities, to interpose a protecting cover of carbolized paper, or film of gutta-percha, to prevent irritation, for no one claims that it would be safe to stop an exposed pulp with a dab of zinc phosphate, or any other irritant. If perfectly protected, the pulp is as safe under cement as under any filling.

But after the pulp is dead, comes the last use of the cements to

be enumerated—that of filling pulp canals. It has been the writer's custom for some time to fill pulp canals with a mixture of oxychloride of zinc and iodoform, and like the advocates of all other pulp-canal filling materials, has had no failures with his favorite! The reason for preferring the oxychloride to the oxyphosphate is obvious, in that the chloride, being a powerful coagulant as well as an antiseptic, places the contents of the tubuli and the stump of the pulp at the foramen, in the best condition to resist decomposition. Then the iodoform is present to destroy any septic poisons that might arise—especially the ptomaines, for which it has a special affinity. Iodoform has been under a cloud since Dr. Black's investigations of the antiseptic power of the different popular antisep-tics, but it is regaining favor as the destroyer of cadaveine, the ptomaines, and toxic products of germ fermentation. So we consider its use indicated in the pulp canals of teeth. The oxychloride should not be used at any time in a live tooth, on account of its irritating power, but it is especially and only indicated in the filling of pulpless teeth.

As a permanent filling material, cement has not, as yet, much value, although the durable kinds in favorable mouths frequently last a long time. But so much depends upon the quality of the oral fluids that no confidence can be placed in their durability and no estimate of expectancy can be made. Yet there has been such rapid improvement in the durable qualities that we can promise more prominence in mouths in which we know by observation that cement has lasted well. In crown and bridge-work, and for porcelain inlays, the quality of permanence is indispensable, and fortunately in these branches the cement is so little exposed, either to solution or mastication, that it is serviceably permanent. We have all seen cement fillings that have lasted for years, and there is no reason why a cement cannot be made which will last in any and all mouths and in all positions. It will dissolve at the cervical border with the best of care, or will wear away where exposed to mastication in most mouths.

We conclude, therefore, that oxyphosphate, and occasionally the oxychlorides, are very useful adjuncts in our work of saving teeth. That they have increased our efficiency there is no doubt, for they render it possible to preserve teeth that could not be saved before the days of the cements. Let us hasten to acknowledge our indebtedness to this humble material and, recognizing its importance, endeavor to develop its capabilities to a yet greater degree, and thereby extend our usefulness.

DEVITALIZING PULPS.

To devitalize pulps, we all know it to be objectionable to place arsenic in a tooth. We dislike to do it. Those of us who have had much experience know the dangers incurred by this practice. If the drug is not properly sealed in the tooth, we find inflammation of the gums, and I have known instances where the arsenic had penetrated to the alveolar process, and caused considerable destruction. In a recent case, I thought the preparation introduced was sufficiently sealed, but when the patient came back in about twenty-four hours, I found inflammation and congestion of the gums, and four or six months afterward removed a large spicula of the alveolar process, which taught me a lesson. I have had success in the immediate extirpation of pulps in the six upper anterior teeth. I have had fair success with upper bicuspids. I never have tried it in molars. I thought it wise to pursue some other course. In examining the mouth of a patient, I found the pulp in the left superior cuspid exposed. He was a woodsman and said he had to go to the woods the following day, and there was only one thing for me to do; to let the teeth go unfilled, leaving them liable to trouble him, or to remove the pulp immediately. I saw no other way except to apply the rubber-dam and remove the pulp. The latter was exposed; I applied Squibb's chloroform freely, and after permitting it to remain two or three minutes, with the engine wheel revolving as fast as it could, I placed a new bar immediately on the pulp, and the shock was so sudden that he did not experience any pain. With a new nerve broach, dipping it into pure carbolic acid crystals, I pushed the broach as near the apex as I could, removing the pulp slick and clean. There was profuse hemorrhage. I waited for a moment, then using clear carbolic acid crystals again, introduced the broach into the pulp canal, which caused a cessation of the hemorrhage. After a few minutes I wiped the tooth out with a solution of bichloride of mercury. I then dried the pulp canal sufficiently, and forcing cotton on a very fine broach to the end of the root, until the hemorrhage had entirely ceased, I passed a little more carbolic acid as near to the apex of the root as I could. There seemed to be no pain on the pressure of the needle to the point of the root. The root was filled immediately with chloro-percha. A gutta-percha point, dipped in the same solution, completed the root-filling. I have followed this practice for the last six or eight years with the upper six anterior teeth and have been successful.

—Dr. French, in *American Dental Association*.

CURING ABSCESES BY PYOKTANIN.

Discussion in N. Y. Odontological Society.

DR. ATKINSON.—Pyoktanin is a pus-killer. It is one of the aniline colors lately discovered. Sprinkle a little of it on the abscess, and the next morning there will be no pus; or, only in the part which you did not succeed in covering with this pus-killer. You will then begin to feel the joy that I experience in getting hold of something that can wipe out a multiplicity of the remedies that we have lauded so much. In using this you must be careful not to get it on your hands or on the face of the patient, as it leaves an ugly stain. But how it does what it does is something we have yet to learn. No man even knows yet how food acts to nourish the body. Until we do know more of these things, we should study the cases closely, so as to have a good reason for what we do. Arrest the inflammatory action, and then fill the tooth with anything that is itself indestructible, and that is in conductivity of thermal currents as near that of the tooth itself as you can get it, and you need not extract the tooth. Liquefied gutta-percha is good. I have had cases that almost any one would have pronounced hopeless. I have told you about a case where the teeth were so loose as to play back and forth, and the left upper lateral incisor so bad that it seemed foolhardy to attempt to save it. I cut the teeth down with a corundum stone until they would occlude properly, and then treated them simply in this manner.

I don't want to say anything that is not profitable for every one. I love my profession, and it is my delight to show any one exactly what I do in each case, and explain how I understand it. Pyoktanin (don't you forget it) is going to make a revolution in surgery. It has already made it in Europe, especially in Germany. I have used it in a case of epulis. With a single exception, it has not been complained of as causing pain. I applied it to an ulcer about the size of a half-dollar, and in three days it was healed. If you will consult Merck's *Bulletin*, the June and September numbers, you will get an authentic statement of it from the source of its origin. Dr. Stilling is the man who made the discovery. He says it is the greatest disinfectant and microbe-killer known, transcending bichloride of mercury and all the strongest antiseptics and disinfectants that we know anything about.

The President: Can we not use it in pulp-canals?

Dr. Atkinson: Certainly. It has been made into a solution. It is stated in the second of Dr. Stilling's papers that the solution when applied goes by preference into the deteriorated or diseased

territory. When used in the eye it makes a beautiful line of demarkation, and the diseased part can be clipped off with scissors.

Dr. Rhein: Can you tell us anything about its toxic effects?

Dr. Atkinson: They say it is absolutely innoxious. In only one case that I know of has it been painful. It will penetrate anywhere, and destroy micrococci or any of the pus-generating microbes, and heal the part by first intention. When we make a surgical operation where the flaps are united by first intention, we say the reason of the wound being so healed is that there were no microbes present to set up a retrograde metamorphosis, but the tissues are glued together by coagulated lymph thrown out, and there is no scar-tissue formed. It is a new formation that makes the bond of union.

—*Cosmos.*

THE "MEDICAL AGE" THUS DEFINES REST.

Rest is *repose*, or *inaction*, of a portion of the organism, during which the waste caused by the wear and tear of work is repaired—repose of a *portion* of the body, for during life we never find the whole at rest. From the time the first blood globule begins to oscillate in the rudimentary blood-vessel till the last sigh dies away in the stillness of eternity, there is no such thing as complete rest.

Human beings are so constituted that they cannot exercise all their faculties at one time. They stand on one foot and rest the other; listen with one ear and then the other; look with one eye while the other is loafing; walk till tired, and then sit down to rest; and when weary of an easy chair, get up and take a walk to "stretch the limbs." They talk till their tongues are tired, and then stop to think of what they will say next. So they go on throwing one set of wheels out of gear to let them cool off and get oiled up, while they set another portion of the machinery running. Even in sleep, in which they come the nearest to complete rest, they are still hard at work. While the brain is standing almost still, the senses locked up, and the muscles relaxed, there are countless thousands of busy laborers at work, oiling up the whole machinery, replacing a worn out cog here and there among the wheels, and sweeping out the dust and débris worn off by the friction of the machinery of this great manufactory of thoughts, words and deeds. When the day workmen stop, the night laborers go on duty, and some of the most skilled artisans are busy during sleep.

repairing the tissues. It is a wonderful process, and as mysterious as wonderful.

The work we do during the day with our heads and hands is what we get credit for; but when we rest and sleep, there is an important work going on. That branch of labor performed while we rest is unseen and unknown by the majority of us, and hence is often neglected.

We are so constituted that the normal, healthful exercise of our faculties gives pleasure. It is pleasant exercise to eat when we are hungry; to rest when we are weary; to walk when the brain is fresh and clear. In fact, to do anything rational, when thoroughly prepared by previous rest, is agreeable. This is not only true of head and hand work, but also of the natural exercise of the feelings and emotions. When trouble comes, the feelings are wounded, relief is found in complaining and sorrow, and pain is washed away by tears. The Omnipotent set a limit also to human sorrow and suffering. These storms of affliction break over the healthy man or woman, and subside after a shower of tears, and give place to sunshine of hope and happiness. It is the weary and worn who cannot rise above their troubles, who go fretting and sighing in search of rest.

A well preserved nervous system can stand an occasional attack of righteous indignation in which considerable strong temper or passion may be manifested, if time is taken to fully cool off between the heats. It is the continual fretting, grumbling, and growling, without intervals of rest, that is wearing and injurious.

The law of harmony between work and rest, when fully obeyed, not only maintains strength, but develops it. All intelligent people know that fact, but many fail to think of it in such a way as to be governed by it. To exercise the muscles of the arms till they are tired, and then thoroughly rest them, and again exercise and rest, makes them grow stronger and bigger. So with the brain, it becomes stronger under well regulated exercise and rest.

Let us give a moment's attention to the various ways of resting.

First and most important of all, "Nature's sweet restorer, balmy sleep." Of all the ways of resting, this is the most complete and important. The time devoted to it should not be regulated by hours so much as by the requirements of the individual. Some one, perhaps Franklin, said six hours for a woman, seven for a man, and eight for a fool. A little girl friend when told this, said, with much wisdom, "I like the fool's share." While admitting that some sleep too much, the majority get less than they need. Sleep

should be taken with great regularity, and be free from all disturbance. Sleepless nights are often spent because of being too irritable from fatigue to rest.

One ought to stop work long enough before retiring to cool down to the sleeping point. Hunger, too, will chase away sleep. We would not recommend late suppers, but some easily digested food taken at bedtime, when needed, will often secure a sound night's sleep. We are told that "He gives His beloved ones sleep," and we know there is much truth contained in this passage. The consciousness of being right and having done well is the best anodyne, the best sleep producer. There is none too much sleep for the righteous, but there is less rest for the wicked who violate the natural laws.

In addition to the good night's sleep, it is a good plan to take a short nap in the middle of the day. It divides the working time, gives the nervous system a fresh hold on life, and enables one to more than make up for the time so occupied. It is well to guard against too long a sleep at such times, since much is apt to produce disagreeable relaxation. There has been considerable discussion regarding the after-dinner nap, many believing it to be injurious, but it is natural and wholesome to many.

Much can be accomplished in the way of resting, short of sleep. It is very important to economize the opportunities for rest during working hours in the day. The great principle which underlies daily rest is relieving of one portion of the organization from duty while the others are at work. This can be done to a great extent. When the muscles are tired and worn from mechanical work which requires little attention of the brain, stop motion and set the brain at work. The laborer can read, think, and speak while his weary limbs are at rest. His brain need not be idle because the hammer or chisel has dropped from his weary hand. On the other hand, a man can work with his hands when his head is tired. The book-keeper whose head is weary with business facts and figures by five o'clock in the afternoon has considerable time in the evening to sing, play, dance, dig in the garden, or black his boots, all or either of which he may do while his head is partially at rest. There is another very important way of obtaining rest mentally, that is by changing from one occupation to another. The dexterous gold beater when he finds one arm getting tired takes the hammer in the other; and so may the man who hammers thoughts out of his brain exercise one set of mental functions while the others are at rest. One may read till tired, and then write; may acquire knowledge till weary, and then teach to others.

A DENTIST'S SUICIDE.

Henry D. Field, a young dentist, committed suicide at his father's residence, in St. Louis, lately, under mysterious circumstances. All the morning he had appeared in good health and spirits, pleasantly conversing with his relatives, and seemed to have nothing unusual on his mind. At about 11 o'clock he sent the servant girl to Watkins' livery stable with a telephone message to Dr. John G. Parrish : "Come at once to 1813 Iowa avenue. If you cannot be here by 12 o'clock, don't come at all."

At 11.30 the occupants of the house were startled by a pistol shot. Hastening into the room, William Field found his brother lying motionless on the carpet before the dressing-case mirror, with a stream of blood issuing from a wound in the left temple. Henry was dead. Dr. Keaney was summoned, and pronounced the case past medical aid. The coroner was notified, but attempts were made to keep the affair from the police and the newspapers.

Despondency over money matters is the most probable cause for the suicide. The dead man was twenty-one years of age and had graduated from the St. Louis Dental College about a year since, but his practice was not large.

—*Democrat, St. Louis, Mo.*

CITY VS. COUNTRY.

One of the greatest mistakes many newly-fledged dentists make, is rushing to the cities to settle. There are circumstances which justify some in choosing a city career in beginning ; but it is a mistake to suppose that there is either less money or fame in a country practice. A beginner in the city has to compete with numerous and old-established practitioners ; he has to begin with a maximum of expense and a minimum of income ; he is tempted, when practice comes slowly, to cheapen his fees and lower what might become a good reputation. Unless he has capital to fall back on he must undergo no small share of worry in trying to make both ends meet ; and, at best, he frequently finds at the end of ten years, that he is financially no better, if not worse, than when he started.

On the other hand, there has been scarcely an exception to the success of young men who begin in the country and the smaller towns. It is safe to say that by far the most prosperous, and certainly the healthiest dentists have been those who hung out their "shingle" in our villages, and whose income, in spite of lower fees, has almost invariably exceeded their outgo.

—*Editorial in Dominion Dental Journal.*

THAT DEATH FROM TAKING GAS.

Two circumstances may occur together and yet one may not be the cause of the other. This is evident from the following, which we find in the *Cosmos*:

The patient had repeatedly inhaled the gas, with only pleasant effects. On this occasion the gas was administered, and two teeth—the upper right first and second molars—were extracted. After the patient had become conscious, the operator went to his desk, and the patient proceeded to rinse his mouth—using the first glass of water while sitting in the chair—after which he arose and walked across the room to the wash-stand, refilled his glass and walked back to the cuspidor, which was beside the chair, and stood rinsing his mouth. This he repeated four times, occupying about twenty minutes. During this time the conversation continued uninterruptedly, the patient and operator being friends of long-standing. There was not the slightest indication that he was not well. The bleeding having ceased, he laid down his napkin, with a remark on the relief obtained from the operation, and stood before the mirror endeavoring to look at the cavities, pressing back the cheek with his right hand. As he removed his hand from his face, he drew his fingers together, and said: "That hand feels numb." He was pale, and it was assumed that looking at the empty sockets of the extracted teeth had produced a feeling of faintness. He was advised to lie down on the couch, which he did unassisted. Brandy was offered to him, but by this time he was unable to articulate. He retained consciousness to some extent for perhaps twenty minutes, and died about four and a half hours afterward.

At the coroner's inquest the physicians, Drs. Girvin, Drysdale, and Hare, were unanimous in the opinion that apoplexy was the cause of death, which was not due to the inhalation of the gas. A brother of the deceased testified that the family were satisfied that death was not the result of the effects of the gas. The jury returned a verdict that death was caused by apoplexy, and exonerated the operator from all responsibility.

Philadelphia, October 7, 1890.

J. D. Thomas.

A MAN AND HIS WORK.—To stop work means for most men a check in their onward progress. They cannot contemplate such a check with anything but pain and dismay. They have marked out the lines of their career, and, like the driver of an express train, they hate to shut off steam. Many a man in the difficult conduct of life gets himself on to wrong lines—lines of overwork, of worry, of stress—which it is impossible for him to sustain. Which is better—to stop now and brave the check and the present loss, or to wilfully persist until broken health, or lunacy, or death prove to be the final alternative? Men think they cannot stop at the present moment because duty forbids. Sometimes no doubt it is so, and individuals have to die as well as to live for their families. But before a man makes up his mind to do that he should be very sure that it is his duty. Many a man's uninstructed conscience and too great self-approbation prove his physiological ruin.

—The Hospital.

BETTER INSTEAD OF CHEAPER MATERIALS.

Many seem to forget that for the advancement of the profession, which we know is largely mechanical, it is just as necessary to have proper materials and well-made instruments as it is to have well-educated graduates, and seem never to stop and ask themselves the question, could we have made the progress we have without proper materials, and has not the manufacturers of materials and appliances been as instrumental in the advancement of dentistry as anything else connected with it? It is a small revenue, after all, in a man's practice, even if he does pay liberally for instruments, when compared to other expenses, and it is sometimes a consolation to me, at least, to know that I can get a well, neatly-made instrument by paying a liberal price for it.

I don't know that I am so much in favor of cheaper materials or instruments; rather, I would say, make them cheaper by making them of better quality, if possible. Give us a great variety of good, well-made instruments and materials for these educated men, that we are clamoring for, to use, and dentistry will advance with as rapid strides in the future as it has in the past. I have never been able to do an operation satisfactory to myself or patients with poor, worn, or cheaply-made instruments, and don't believe any one else can; therefore, let us not forget that the manufacturers deserve some credit for the progress of dentistry, as well as others.

—*Editorial in Southern Dental Journal.*

TAKING IMPRESSIONS.—L. C. Ingersoll says:

I have never heard of any one using my method of preparing plaster so as to avoid adhesion of the plaster to the teeth. The adhesion is due to the great affinity of the plaster for water, and unless that affinity is perfectly satisfied in the adding of water to the plaster in making the mixture, it will absorb every bit of the lustre from the teeth, and then cause an adhesion. The first point, then, is that the plaster shall be thoroughly mixed. Have a large quantity of water—all that it would take up—and then wait long enough for the union to be complete; that is one point. The next point is that I would add to the plaster from one-third to one-half of pulverized pumice, according to the strength of the plaster. Some plaster would not take more than half, while others would take two-thirds pulverized pumice; then it requires less water and the adhesion to the teeth is almost entirely prevented, and you get your impression out of the mouth with less liability to fracture.

[We think a much better plan is to slightly oil the teeth, if there are any left, before taking the impression. The pumice tends to prevent a sharp impression, but the oil allows the hardened plaster to slip from the teeth easily and smoothly. Many failures would thus be prevented.—ED. ITEMS.]

THE SKIN OF THE TEETH.

After the long-meter doxology and appropriate hymns had been sung by the congregation in the Academy of Music, and prayer had been offered, Dr. Talmage preached on "Narrow Escapes," taking as his text Job xix, 20: "I am escaped with the skin of my teeth." Among other things he said:

Job had it hard. What with boils and bereavement and bankruptcy, and a fool of a wife, he wished he was dead, and I do not blame him. His flesh was gone, and his bones were dry. His teeth wasted away until nothing but the enamel seemed left. He cries out: "I am escaped with the skin of my teeth." There has been some difference of opinion about this passage. St. Jerome and Schultens, and Drs. Good and Poole and Barnes have all tried their forceps on Job's teeth. You deny my interpretation, and say: "What did Job know about the enamel of the teeth?" He knew everything about it. Dental surgery is almost as old as the earth. The mummies of Egypt, thousands of years old, are found to-day with gold fillings in their teeth. Ovid and Horace and Solomon and Moses wrote about these important factors of the body. To other provoking complaints Job, I think, has added an exasperating toothache, and, putting his hand against the inflamed face, he says: "I am escaped with the skin of my teeth."

A very narrow escape, you say, for Job's body and soul; but there are thousands of men who make just as narrow escape for their souls. There was a time when the partition between them and ruin was no thicker than a tooth's enamel, but as Job finally escaped, so have they.

EDITOR ITEMS.—Will you please ask Dr. Davisson, of Holly, New York, why he uses a wash bottle between his gasoline gasometer and Bunsen burner, and what fluid he uses in it. Can this gas be used for soldering, and is it better than alcohol?

W. O. Robinson, Parker, S. D.

NEW YORK PASTEUR INSTITUTE,
New York, October 15, 1890.

To date, 610 persons, having been bitten by dogs or cats, came to be treated. These patients may be divided in two categories:

First.—For 480 of these persons it was demonstrated that the animals which attacked them were not mad. Consequently the patients were sent back after having had their wounds attended, during the proper length of time, when it was necessary. *400 patients of this series were consulted or treated gratis.*

Second.—In 130 cases the antihydrophobic treatment was applied, hydrophobia

having been demonstrated by veterinary examination of the animals which inflicted bites or by the inoculation in the laboratory, and in many cases by the death of some other persons or animals bitten by the same dogs. *All these persons are to-day enjoying good health. In 80 cases the patients received the treatment free of charge.*

The persons treated were: From New York, 64; New Jersey, 12; Massachusetts, 12; Connecticut, 8; Illinois, 9; Missouri, 3; North Carolina, 3; Pennsylvania, 3; New Hampshire, 2; Georgia, 2; Texas, 2; Maryland, 1; Maine, 1; Kentucky, 1; Ohio, 1; Iowa, 1; Nebraska, 1; Arkansas, 1; Louisiana, 1; Ontario, Can., 1.

With kindest regards of the Pasteur Institute,

Paul Gibier.

[The article from *The Inventive Age*, referred to by Dr. Driscoll, was reviewed before we published it in the ITEMS by Dr. C. C. Carroll, President of the Carroll Aluminum Manufacturing Company, who pronounced its statements truthful. We are glad to hear so much of the history of aluminum in dental practice. Let us have more.—ED. ITEMS.]

EDITOR ITEMS:—In 1868, St. Louis dentists were making swagged aluminum “dental plates,” mounting the teeth with vulcanized rubber. And we did this just as long as we could purchase the plate at our dental depot. Many dentists were unsuccessful with the plate, owing, I think, entirely to careless manipulation. [Or, perhaps, impure aluminum.—ED. ITEMS.] The least particle of lead or zinc, melted into it by annealing, made holes in it immediately, or they appeared after a few months’ wear. As to myself, I never had trouble, for I thoroughly boiled the plate in dilute sulphuric acid after each “swagging” and before annealing it. The plates gave great satisfaction, and some of those plates I have seen after fifteen years’ wear, and without disintegration.

Dr. Henry S. Chase, St. Louis, Mo.

But pretty well known as “Pa Chase” by the “Single Tax Men” of the U. S.

EDITOR WELCH:—The January ITEMS put in an appearance this morning a little late, but what a journal for eight and one-third cents! Of course, that don’t begin to cover the expense of such a production. I congratulate you on the new dress, and the new type; whilst the 1890 ITEMS were more than a person could reasonably expect, yet the type was a little too small for comfortable reading, but this month you place before your readers something that is really astonishing, both in matter and manner.

I take off my hat to you for giving us such a wonderful journal for the insignificant sum of \$1.00 per year.

A. W. McCandless, Davenport, Iowa.

PRACTICE VS. THEORY.

In the Dec. issue of the ITEMS OF INTEREST, I see Dr. George B. Snow has given quite a lengthy article on a "new method of vulcanizing rubber plates." While I believe the doctor's experiments were just as he has given them, yet, I must say, with kind regard, that some of his conclusions concerning the effects are based on a wrong cause. He says:

If rubber is closely confined, a force may be exerted by its expansion which the contents of the flask cannot resist. Broken blocks, open joints between the sections, teeth forced out of place; all these annoyances are due to the close confinement of rubber by insufficient gateways, etc.

For fourteen years I used flasks, and many times with the same results that the doctor has mentioned—believing that the expansion of the rubber was the cause. But I now know if rubber (Doherty's) is correctly vulcanized it *will not* produce such effects.

For about the last six years I have exclusively vulcanized patch-work, partial and full sets, incased ONLY in plaster—without gateways, and the plaster not over a fourth of an inch thick to the teeth and rubber. The plaster *does not burst*, the rubber is *not forced between the joints*, nor *shrink from the pins*. Try it again, doctor, and let us ALL remember not to be too hasty in jumping at conclusions.

In the *Ohio State Journal of Dental Science*, October, 1886, I gave a brief description of my method of vulcanizing without flasks.

—B. T. Radcliff, Paoli, Ind.

DR. WELCH:—I have an acquaintance who has a child twenty months old, who was born with the lower central incisors erupted. Is this premature and unusual dentition, or have you heard of many cases before?

The article "Drumine," which you wrote about in the December number, appeared four years ago in *The Lancet* and *Quarterly Therapeutic Review*. It will be a good local anesthetic when it is developed, but don't you think it is a long while developing?

I have a patient, a youth of fifteen, who had a supernumerary lower incisor between the left central and lateral, and turned on itself, which I extracted, and am now drawing the other teeth over to make room for the right cuspid, which had been crowded out, the supernumerary being the cause of the crowded condition.

I appreciate the ITEMS OF INTEREST very much, and would not be without it.

H. M. Ramsden, D.D.S., Philadelphia.

DR. THEODORE S. EVANS.

The death of Dr. Theodore S. Evans, the brother of the widely known American dentist of Paris, Dr. Thomas Evans, was announced to his friends in this city recently by cable.

Dr. Evans was nearly seventy years of age. He went to Paris upward of thirty years ago and engaged in the practice of dentistry with his brother. About twenty years ago he retired to private life, and had since been engaged in charitable and religious work in Paris. For a number of years, and at the time of his death, he was one of the wardens of the American Church of the Holy Trinity, of which the Rev. John B. Morgan is the rector. He was personally acquainted with hundreds of Americans who have sojourned in Paris, and with his wife was wont to entertain very largely.

Until recently Dr. Evans was very robust and vigorous in health. His wife, who survives him, was the only daughter of the late Daniel D. Howard of this city. She spent her girlhood here, and also received her education in this city. Dr. Evans' residence in Paris was at No. 18 Boulevard Maillot, just outside the city walls. He was a native of Philadelphia, in which city he received his education.

Dr. Thomas W. Evans went to Paris to assist his countryman, Dr. Brewster, also a dentist. In a short time he purchased the business and Dr. Brewster retired. It was then that his brother Theodore went to Paris. Their partnership seems to have turned out most fortunately. They soon had a virtual monopoly of the court practice, which brought them work from all parts of the Continent and Great Britain.

—*Post, New York City.*

“THE ITEMS OF INTEREST,” says our esteemed confrére, the *Dominion Dental Journal*, “succeeds in crowding useful items about all sorts of things from all sorts of sources, mostly extracts from all the journals.” This left-handed compliment is slightly apocryphal, as the “all sorts of things” “crowded” in the ITEMS every month are “sorts” which are intended to educate and elevate the profession in whose interest it is published, and instead of being made up mostly of extracts from the dental press, we beg to inform Brother Beers that the ITEMS contains as much, if not more, original matter as the average dental journal. It may be a source of great comfort to our facetious friend to learn that the ITEMS has a larger circulation than any other dental publication in the United States.

TO CONTROL OCCLUSION.

“G. M. M.” in the *Cosmos* Hints and Queries for August, 1890, asks :

What is the best method of inducing, or directing, a patient to bite so as not to throw forward the lower jaw when the occlusion is to be taken in wax for prosthetic purposes?

I combine two old methods, and do not see how anything could be better, for I have felt no need for anything else during the fourteen years I have followed the plan, which is as follows: Direct the patient to exert the force in closing that he would do if crushing something between the molar teeth or extreme back part of the mouth on both sides at once, and also at the same moment swallow, or perform what some writers call “empty deglutition.” I am aware some practitioners will claim that they have tried this plan and found it a failure. If so, the fault was not in the method, but in the operator. It requires great care to always preserve and accurately apply to use even a correct “bite;” and there is no doubt the patient is often blamed when the fault was entirely with the dentist. If a piece of wood is buried in the wax to arrest closure at a given point, the soft, yielding gums or ridges may be greatly depressed at that point, so that when the correctly-shaped cast is placed in the “bite” it cannot go to its proper place until the points over or at the wood are cut away, so as to allow the cast to go to the right place. While it may be that this is not the *best* method, if rightly applied there is no need of a better.

—W. E. Driscoll, Manatee, Fla., in *Cosmos*.

EDITOR ITEMS:—Under the title of “Local Anesthetics,” I see in your October issue (p. 459), an extract from *Dental Headlight*, respecting cocaine. For those “who do not believe that cocaine will kill,” I send you the following translations. The curious verdict is also worthy of the attention of your readers.

Dr. H. J. Harwood.

68 Rue de l’Hotel de Ville, Lyon (Rhône), France.

Petit Journal, of Paris, August 11, 1890: It is acknowledged to-day that Jeanne Delcambre, of whose mysterious death at the dentist’s I spoke recently, has been poisoned by cocaine. The post-mortem examination was made yesterday, and Dr. Dutilleul attributed the death to the administration of cocaine to a nervous person.

As sequel to the above is this comment in a Lyon paper:—

Le Nouvelliste de Lyon, October 27, 1890: If the effects of cocaine are generally successful, the results are sometimes greatly to be regretted, because it occasionally produces anesthesia so well that the patient falls into a fainting fit—

and wakes no more. In such an event ought the dentist be held responsible for the death of his patient? Such a question has recently been posed before the court of Lille, and the judges decided in the negative. The dentist in question was one B., charged with causing the death of Mlle. Delcambre, who died immediately after the extraction of a tooth, several injections of cocaine having previously been administered. He was charged with *homicide par imprudence*. The verdict states that the young girl succumbed during syncope. That it has not been proven that the use of a small dose of cocaine had caused death, but that death was very probably the result either of the shock, caused by the extraction, or by reason of the nervous temperament, or anemia of the young person. But B. was fined fifteen francs for illegal practice of medicine. "Whereas in administering, on the 8th of August last, injections of cocaine on the person of Jeanne Delcambre, and not possessing a diploma, he has infringed the law of An XI, concerning the practice of medicine, that in reality cocaine is an anesthetic, demanding much prudence, and may only be employed by medical doctors."

EDITOR ITEMS:—In these days when platina has so greatly advanced in price, a few hints may be of service. If it is desired to put platina scraps into a usable form again, the following is useful: Take a small piece of gas-pipe and close one end by welding. Put the platina scraps into the open end, and with an iron rammer drive it home. Now heat the pipe to an extreme welding heat, and placing it quickly on an anvil, strike it one or two hard blows with a sledge; or, what is better, put it under a drop or trip hammer. Cut out the portion of the pipe containing the platina, and throw it into nitric acid to dissolve away the iron. This will leave the platina in a mass welded together to be rolled into plates or drawn wire. So large a difference is there between the price paid for scrap platina and that asked for the sheet metal or wire, that this simple process may be of use to many. It is, of course, advisable that no gold or other metals should be mixed with the scraps.

James H. Beebee, Rochester, N. Y.

WHY IS THIS THUS?—**EDITOR ITEMS:** In a hurried examination of "A Monthly Bibliography of Dental Literature," in the *Dental Cosmos* for January, 1891, I fail to find a single reference to the **ITEMS OF INTEREST**. Yet the editor claims this bibliography contains as complete a record of dental literature as can be gleaned from current periodicals. Formerly, articles appearing in the **ITEMS OF INTEREST** received the same attention by the editor as those in any other dental journal. Why is this thus?

W. E. Driscoll.

It is not their fault. We are so close upon their heels they can't see us.—**ED. ITEMS.**

RAW RUBBER vs. VULCANIZED RUBBER.

Pure rubber lacks many qualities that are desirable, for instance, it lacks durability, losing its elasticity. The discovery was made by Chas. Goodyear in 1843, that if sulphur was added to rubber, and the mixture subjected to heat for some time, the result was a great improvement in desirable qualities. The product was called *vulcanized rubber*, and the process *vulcanization*. It was further discovered either by Nelson Goodyear or by Austin G. Day, that by increasing the quantity of sulphur, and raising the temperature of vulcanization, quite a new and different product was obtained, and to it was given the name of *hard rubber* or *vulcanite*.

In the manufacture of various articles the proportion of sulphur, the temperature, and time of vulcanizing are varied, and in some instances other materials are added to color or to adulterate the rubber, thus producing various grades. Soft vulcanized rubber has about 25 parts of sulphur, and the temperature for vulcanizing is between 250° and 300° F. *Vulcanite* or *hard rubber* a mixture of 100 parts of caoutchouc is mixed with 50 parts of sulphur, and vulcanized at about 300° or 320° F. This is for artificial dentures, hard rubber combs, pen-holders, pencil cases, etc. That the hardness of *vulcanite* depends principally on the quantity of sulphur mixed with it is proved by vulcanizing a piece of our plate rubber in contact with something that has greater attraction for sulphur. For instance, if a piece be vulcanized in contact with silver, some of the sulphur will unite with the silver, and the rubber in contact with it will remain soft, owing to the loss of sulphur. Both soft and hard vulcanized rubber are colored by adding various pigments. The coloring matter has, however, no effect in the vulcanizing, but only adulterates and weakens the product. The comparative qualities are best shown as follows:

Rubber,	Soft Vulcanized Rubber	And Vulcanite.
Pure	R, 100+S, 25 or less.	R, 100+S, 50.
1. Pliable.	Pliable.	Hard.
2. Loses elasticity.	Retains elasticity.	Elastic.
3. Softened by heat.	Unalterable by heat.	Softened by heat.
4. Rigid in cold.	Not affected by cold.	Not affected by cold.
5. Soluble.	Insoluble.	Insoluble.
6. Perishable.	Durable.	Durable.
7. Adhesive.	Inadhesive.	Inadhesive.
8. Unpleasant odor.	Less odor.	Odorless.
9. Non-conductor.	Non-conductor.	Non-conductor.
10. Permeable.	Somewhat impermeable.	Impermeable.
11. Not polishable.	Not polishable.	Polishable.

—Prof. C. L. Goddard, in *Western Dental Journal*.

SPRAY AS AN OBTUNDENT.—At the International Medical Congress in Berlin this summer, I saw an apparatus exhibited by Dr. Niles, of Boston, which is the best I have seen for obtunding sensitive dentine by means of a spray. It is a small metallic instrument shaped like a chip blower with a bulb to contain alcohol. The bulbous portion is heated over a spirit flame till a spray is emitted from a small orifice at one end and the hot alcohol spray applied directly to the cavity. Combining as it does essential elements for dehydration, viz., heat and chemical affinity, we may hope for good results in its use.

Dr. Otto Arnold.

TO REDUCE NERVE BROACHES.—I have a little device which is used to reduce, to any infinitesimal size, nerve broaches, which we all find so necessary. It is nothing more than taking a soft steel and rubber packing and placing between them emery disks, and by placing the small broach in between this and revolving it, it cuts it down to any size desired. If you will try it, you will find it one of the most useful things you ever had in your office, and the means of removing the pulp from the finest canals. It has given me more satisfaction than anything else I have in my office.

—Dr. Bonwill, in Int. Jour.

GEORGE A. WILSON, D.D.S., in a paper read before the New York Odontological Society, the subject being "The Treatment of Proximate Surfaces," says: "If enamel must be left at the cervical border, trim it smoothly, slightly round or bevel the edge, and place and pack the first pieces of soft gold with hand pressure. No malleting is allowable here until a thickness of gold sufficient to protect the thin rim of enamel from fracture by the mallet is secured."

A CONVENIENT HELPER.—When inserting a gold filling in the teeth, it sometimes happens that the under wall has not been built out enough, and gold must be added from the under side. By slipping a matrix of thin steel, such as ribbon-saw material, between the proximate surfaces, the gold can be welded much easier, with less liability of chipping the tooth enamel.

—Ohio Journal

TO KEEP RUBBER DAM FROM SLIPPING.—After the rubber is in place, and the teeth and rubber dried with napkin or bibulous paper, dust finely pulverized rosin on the teeth and rubber. This will generally keep the dam in place, without other aid.

—S. G. Welch, Off. and Lab.

Our Question Box.

WITH REPLIES FROM OUR BEST AUTHORITIES ON DENTISTRY.

Address all questions for this department to DR. E. N. FRANCES, Uvalde, Texas.

Question 9. *How many drops of a four per cent solution of cocaine do you inject, and how long do you wait before extracting the tooth?*

Do not approve of the use of cocaine for extracting.

M. P. Beecher, 834 Broadway, N. Y.

Cocaine I do not use, and I do not extract teeth.

Adams Bishop, N. Y.

I never use cocaine.

R. A. Fones, Yonkers, N. Y.

I do not use cocaine in extracting.

J. D. Bell, Allegheny, Pa.

I never use cocaine for such purpose. Extract only by having my patient breathe rapidly for one and a quarter minutes—done this fourteen years—perfect success.

Bonwill, Philadelphia.

I use from five to ten drops of cocaine, and wait about one minute, either to extract or make any incision in the gum.

J. E. Cummings, D.D.S., M.D.S., Syracuse, N. Y.

I do not use cocaine as a local anesthetic; prefer fluid extract pellitory, applied with "Von Bonhorst applicator."

M. H. Fish, New Berlin, N. Y.

Used two to twelve minimis, waited one to twenty minutes—results varied. After using the drug more than three years, for more than one thousand extractions, abandoned its use as being unsatisfactory.

J. H. Murphy, Flavonia, Tex.

I do not use cocaine, as I consider it a very dangerous drug, and it does not amount to anything for extracting teeth.

M. K. Bartlett, Waltham, Mass.

I use a piece of spunk, about the size of a small pea, saturated with four per cent cocaine. Paint the gums against the teeth to be extracted three times, from three to five minutes apart.

R. L. D., Greenwich, N. Y.

The use of cocaine I have abandoned as being very unsatisfactory for obtunding pain in extracting teeth.

J. H. Batchelder, Salem, Mass.

I use cocaine, but seldom place much dependence on it. Have used from four to six minimis successfully, waiting from five to seven minutes, according to the pathological condition of the tooth. I do use Jacquey's dental anesthetic, however, and successfully in every case, some being more susceptible to its influence than others.

F. P. Dewey, D.D.S., Watertown, N. Y.

I use ten drops of cocaine of a four per cent solution, wait from thirty to sixty seconds before removing the tooth. Had some good results by using an eight per cent solution, painting gum with camel's-hair pencil around the tooth I wished to remove, waiting about one minute.

Harry Zimmerman, Annville, Pa.

I have used cocaine very little for extracting. I should think, however, that about three drops injected on each side of the tooth would be sufficient, and extract in from three to five minutes. *W. B. Banks, Detroit, Mich.*

Question 10. *A child two years old, treated six months for indigestion, and about to die, has four teeth extracted and recovers. Will their removal effect the permanent teeth?*

No. *M. P. Beecher, 834 Broadway, N. Y.*

I do not think the permanent teeth will be effected.

Adams Bishop, N. Y.

Think it will interfere with the eruption of the permanent teeth, but not with their formation. *R. A. Fones, Yonkers, N. Y.*

There is danger of roughness and imperfect enamel, as you strip the permanent teeth of their protection. I think that is the only harm from such early extracting. *J. D. Bell, Allegheny, Pa.*

The permanent teeth will be retarded, but may appear. Think your case could have otherwise been cured than by extracting. It was a mistake. I have two cases, which I am watching, six years old, where the temporary lateral was never erupted on one side. *Bonwill, Philadelphia, Pa.*

Yes, I think the removal of four temporary teeth cannot be otherwise than a drawback to the permanent teeth.

J. E. Cummings, D.D.S., M.D.S., Syracuse, N. Y.

I believe the permanent teeth are always effected to some extent by the early removal of the temporary; such early removal being partially, if not wholly, responsible for malocclusion, imperfect development, etc.

M. H. Fish, New Berlin, N. Y.

Yes, biologically, pathologically, and physiologically favorable by re-establishing nutrition; unfavorable as to the regularity of permanent teeth, the extent dependent on many circumstances.

J. H. Murphy, Flatonia, Tex.

I think it a very bad practice. They should be filled in every case, as it causes contraction of the jaw, and the permanent teeth will be crowded out of place. *M. K. Bartlett, Waltham, Mass.*

I think it will not affect the permanent teeth, but the jaw will not expand properly and the teeth will be crowded.

R. L. D., Greenwich, N. Y.

The removal of teeth from the mouth of a child, at the age mentioned, should be only as a last resort. Teeth removed this early retard the proper development of the jaw, hence crowding and unevenness of the permanent set. In nearly fifty years' practice I have refused to remove children's teeth until the age of about six years. *J. H. Batchelder, Salem, Mass.*

Chances are the second teeth will be affected as regards their regularity. This rule does not always work, though, as I have seen exemplified in a few cases coming under my observation.

F. P. Dewey, D.D.S., Watertown, N. Y.

Would say, according to my judgment, the teeth in case stated, will be affected. The permanent teeth may have a tendency to become very irregular while erupting, and show defects or marks at the point of calcification if the treatment of the child occurred during the period of coronal calcification. In nine cases out of ten there will be imperfect crowns on those teeth.

Harry Zimmerman, Annville, Pa.

The loss of teeth in one so young will have a great tendency to produce irregularity. I think the case was wrongly treated, as the child most likely had irritation of the stomach rather than indigestion, and obtained relief from bleeding caused by extraction. By bleeding the gums above any teeth that were in process of eruption would relieve the inflammation of the mucous membrane and remove the cause of irritation of stomach.

W. B. Banks, Detroit, Mich.

B. J. H.—Your question is too indefinite for question box. If the teeth are in such a condition that cavities can be made deep enough to anchor fillings, I would, by all means, fill them. If the teeth are reasonably hard, fill with gold; if not, plastic fillings may be used until they are in a condition to support gold. Often, in cases of this kind, the broken places, if not too deep, can be polished off and left until the teeth reach a degree of hardness that will insure a successful building up with gold. The treatment, and answer, depends on the case in hand. *E. N. Francis, D.D.S.*

EDITOR ITEMS:—Is platina used as a material for filling teeth? If so, in what form? In the form of a foil, or as an amalgam? If, in the latter, is it used in combination with other metals, and in what proportion? And what advantage is there in it over any other of the standard makes of amalgam? Please answer in ITEMS OF INTEREST.

Callaham and Ashton.

Platina has been used sparingly as a very thin foil, folded up with gold foil for filling teeth, but we see no advantage in it over pure gold foil. The presence of platina in amalgam seems to give the alloy smoothness and fineness of grain. We experimented for many months with platina in amalgam before we were convinced of its effects and the best proportion to the other metals. That the presence of gold and platina in alloy certainly makes it superior in plasticity, edge strength, hardness, and making it susceptible to a higher and more permanent polish, can be seen by comparing it with amalgam not containing these metals; for their presence in our alloy is the only difference between this and our amalgam. The proportion of tin to silver is the same in both. *T. B. W.*

Monthly Gossip with Readers and Correspondents.

BY WM. E. BLAKENEY, D.D.S.

PYOKTANIN is a new antiseptic of doubtful utility.

DENTAL JOURNALISM was inaugurated in 1839 by the publication of "The American Journal of Dental Science."

THE AILES APPARATUS which throws a jet of vaporizing alcohol on the dentine is said to be very reliable in easing pain.

DR. W. H. SEDWICK is of the opinion that a dental law is needed which would make it unlawful to extract teeth that can be saved.

FOR THE TRANSLUMINATION of the larynx a lamp has been devised that is applied to the external surface of the pomum Adami or near the cricoid cartilage.

COMBINATION FILLINGS seem to be gaining in favor. If pure tin is used with gold—not tin foil which contains more or less lead—we see no reason why satisfactory results may not be obtained.

DR. S. C. G. WATKINS says that "the clinical teaching in dental education is the stronghold of the practical." Object lessons have an impress on the memory that is not quickly obliterated.

IF DRUNKENNESS is an hereditary disease, as some people believe, there should be a law prohibiting those addicted to it from entering into wedlock. This would be a practical temperance measure.

DR. GILLETT speaks hopefully of a new apparatus for obtunding sensitive dentine without inflicting pain. It is simply a means of obtaining dryness in the cavity by the use of a continuous current of warm air.

"THE ANTISEPTIC PROPERTIES OF PEROXIDE OF HYDROGEN AND OZONE," is the title of an interesting paper read before the International Medical Congress, Berlin, by Dr. Paul Gibier, Director of the Pasteur Institute of New York.

"If," says Dr. Bartlett, "cement will not last when put into a cavity of a tooth at the gum line, we should hardly imagine that it would last very long when only protected by a thin gold band placed below the gum line, where secretions have continual play at it." This argumentative shot hits the mark at which it is aimed, and hits hard.

THE EDITOR of *The Dental Register* contends that "all surgical and dental instruments and appliances, used in the relief of human suffering, should have free passage so far as tariff is concerned, into and through all civilized countries of the world."

THE COUNTY DENTAL SOCIETY, of Philadelphia, is said to have adopted a protest against dentists being classified by the Census Bureau with manufacturers. "Like enough thou know'st thy estimate," but "Men are men; the best sometimes forget."

DR. BLACK, in his able work on "The Pathology of the Dental Pulps," speaking from long experience, says: "I believe there are comparatively a small number of cases where we are able to so protect the exposed pulp as to leave it in a normal condition."

DR. MILLER being asked "What are the microscopical differences between nodular calcification of the pulp in elephants' teeth and that in human teeth," replied: "The formation in the pulps of the tusks of elephants are identical with those occurring in the human teeth."

"IN REFERENCE TO TECHNICALITIES," says Dr. James Truman, "there is a certain class of scientific men who, in their dealings with their special work, so overload the matter with technical terms that they can never be clearly understood even by those equally advanced as themselves."

DR. BONWILL says he is filling more teeth with amalgam at the present time than he has ever done in his lifetime, and that "where the packing of amalgam is understood there will be a better system of practice, a larger number of teeth saved, and a larger amount of contour work done."

WHILE THE PROFESSIONAL mind is being exercised on the subject of higher dental education, a no less important question, viz.: The education of the people in dental hygiene is also receiving intelligent attention. Dr. Osman is of the opinion that this study should be thoroughly aired in all our schools.

LET US REMEMBER that the keynote of the highest civilization which the world can know is the brotherhood of man. He who intrenches himself in the hard, unblushing philosophy of selfishness is the only one to ignore the crying wants of his brother, and such a one deserves to be tabooed by everybody as worse than a leper.

DR. J. ALLEN OSMAN is of the opinion that "the time is ripe for a consultation fee, for many an hour is wasted by persons coming into a dental office and calling the dentist from his chair for ex-

amination and consultation, regarding what is best to be done." The doctor, evidently, believes in the "revenue" principle, which is right.

DR. WERNER believes that "some day we will have a plastic filling that will require very little excavation—simply the wiping out of the cavity and the thorough removal of the actual decayed portion, leaving all that has sensation—treating the cavity antiseptically, and when in an aseptic condition to fill with plastic filling."

DR. I. J. WEATHERBEE calls copper amalgam "the blackest sheep in the whole lot of amalgams. Some," he says, "think it serves a better purpose than any other filling, because, by its peculiar properties, it bids defiance to the whole tribe of microbes—that it puts them all to sleep and keeps them harmless, which," he thinks, "is not the case."

"AMALGAM," says Dr. G. W. Denis, "is, undoubtedly (in a general sense) the best material now in use for mounting crowns. The discoloration at the gum line being the principal objection; but this can be obviated by using a band, and double strength is thus secured, as the filling of amalgam not only protects the root from decay, but greatly strengthens it."

W. H. SEDWICK, D.D.S., President of the Ohio State Dental Society, in a late address, says: "I would urge upon our colleges the importance of matriculating none but such as give evidence of a good scientific and classical education." Very good, doctor, but did it never occur to you that the ablest men in our profession to-day do not possess a classical education?

A NEW OZONIZED COMPOUND has recently been discovered by Prof. Charles Marchand, who calls it "glycozone." This glycozone results from the reaction which takes place when glycerine is exposed to the action of ozone under pressure—one volume of glycerine with fifteen volumes of ozone produces glycozone. It is said to have a very destructive action upon vegetable cells—microbes.

Another remarkable surgical operation has just been performed in this city: the removal of the entire left arm, shoulder blade and collar bone, with their muscles, of a man fifty-four years old. The arm was utterly useless, the tissues surrounding the two joints being thoroughly infiltrated with a cancerous growth. It was to prevent a recurrence of this growth that the shoulder blade and collar bone were removed.

For Our Patients.

SUCCESSFUL TRANSFUSION.

It is always a pleasing duty to have to record examples of devotion to the welfare of their patients on the part of medical men; and though but few are ever recorded, they would, if published, form a long catalogue. Such an instance earned the just encomiums of the *Hull Examiner* in a recent number, where we find mention of the success attending the transfusion in a patient who had apparently been attacked by internal hemorrhage, the operator himself giving the blood. Though, very properly, our lay contemporary does not give the name of the operator who thus distinguished himself for his humanity and skill, there can be no objection to our stating that it was Mr. Robert Hagyard. We are also enabled to give some details of the case. It was one of cancer of the breast, which had been removed ten days before by Mr. Hagyard. While the wound was being dressed the patient was suddenly attacked by syncope. She became pallid and completely collapsed—a condition not to be accounted for by the fact that she was the subject of mitral disease. After the subcutaneous injections of brandy and ether, and the performance of artificial respiration, Mr. Hagyard decided to have recourse to transfusion. This was effected by means of Aveling's apparatus, the blood being taken from his right arm (he is left handed) and injected directly into the patient's veins. It was calculated that more than a pint of blood was transfused, the operation being terminated by the operator becoming faint. The result was most satisfactory, for at the end of ten minutes the patient had completely recovered, and in a few days was able to leave the hospital. The cause of the collapse was thought to be internal hemorrhage, as on the following day the motions were observed to be blackened. There is no doubt the patient owes her life to Mr. Hagyard's prompt and courageous act, which he had to perform with only the assistance of a nurse. It may be remembered that a similar instance of a surgeon resuscitating a woman suffering from puerperal hemorrhage by transfusing blood from his own arm was recorded a few years back from a Hampshire village; and we may recall the statement of Professor Von Nussbaum (who, we regret to learn, is seriously ill) that he had given blood for this purpose no less than ten times.

—*The Lancet.*

\$3,250 AN OUNCE.**GALLIUM, A METAL THAT MAKES GOLD SEEM WORTHLESS.**

Probably ninety-nine persons in one hundred, if asked to name the most precious metals, would mention gold first, platina second, and silver third. A few might add nickel and aluminum to the list. Let us see how near the truth they would be.

Gold is worth about \$240 per pound, troy; platina, \$240, and silver about \$12. Nickel is quoted at about 60 cents, and pure aluminum at \$2 to \$3 per troy pound. Now compare these prices with those of the rarer and less well-known metals.

Taking them in alphabetical order, barium sells for \$975 a pound, when it is sold at all; and calcium is worth \$1,800 a pound. Cerium is a shade higher—its cost is \$160 an ounce, or \$1,920 a pound. These begin to look like fabulous prices, but they do not reach the highest point; chromium brings \$200 an ounce, cobalt falls to half the price of silver, while didymium is the same price as cerium and erbium, \$10 cheaper on the ounce than calcium, or just \$1,680 per pound.

The wealth of the Vanderbilts amounts to nearly \$200,000,000. With this sum they could purchase 312 tons of gold, and have something left over; but they couldn't buy two tons of gallium, that rare metal being worth \$3,250 an ounce. With this metal the highest price is reached, and it may well be called the rarest and most precious of metals.

IN CAPS AND GOWNS.

The students of the Indiana Dental College will soon be wearing caps and gowns. As far as known, the institution will be the first in the West to adopt the fashion. The students will look a little strange to us at first, and the small boy might be tempted to throw stones at them if they should appear on the street in the odd outfit; but the public will soon get used to them, for people remember that it wasn't so very long ago that they jeered at a man on a bicycle, now so common a sight that the old inclination to slay him does not seize a pedestrian unless the man gets on the sidewalk with his "devil carriage."

Dr. Hurty, one of the Faculty of the Dental College, said that the adoption of the college cap and gown is not an affectation with the students. It is a classic garb that lends dignity to the wearer; but one of the great points in favor of it is its utility on public oc-

casions. Many a worthy student who has to struggle through college finds the purchase of a dress suit for graduating day a grievous burden which he cannot afford to bear. The cap and gown relieves him of it. They cost but \$5 or \$6, and one can rent an outfit for \$1. There is a legend that before now students who were able to afford only a shirt, trousers, and a pair of shoes have cut quite a figure as to personal appearance at commencement in one of these uniforms.

—Ex.

ARTIFICIAL TEETH LENGTHEN LIFE.

Very few people realize how much the dentist has done for mankind. To mention one thing only, the perfection to which the manufacture of artificial teeth has been carried has practically abolished old age—that is, old age in the sense that I used to know it. You see few of the helpless, mumbling old men and women that you formerly did. This is not because people do not attain the age their parents and grandparents reached, but because the dentist has prevented some of the most unpleasant consequences of advancing years. Men of seventy no longer either look or feel old, because they are not deprived of nourishing food at the time when they need it most. Estimates have been made showing that the average length of life has been increased from four to six years by the general use of artificial teeth.

—Ex.

EFFECTS OF GAS.

There are many laughable and painful occurrences in nearly every dentist's office, as every one is aware. Not long since a modest and pretty lady appeared at a well-known dentist's in this city and said she wanted some teeth extracted, and wished to take gas. She was accordingly placed in the chair and the anesthesia administered. No sooner had it taken effect than she commenced using the choicest kinds of street profanity, much to the astonishment of the tooth-puller. The lady soon recovered and departed smiling, totally unconscious of her depravity while under the influence of the gas. One man, as soon as the exhilarating effect of the gas was felt, got out of the operating chair and executed the finest kind of a clog, much to the amusement of the dentist. That patient was a minister who belongs to a denomination that does not believe in dancing.

A HUNDRED AND FIFTY MILES FROM A DENTIST, AND HOW I GOT THERE.

"When I hear a man talk about dentistry," said Mr. Fuller, "I am reminded of my experience in Nevada.

"I had the toothache. I had it bad. It ached days and it ached nights, and it woke with me in the mornings. The miners did what they could for me. They tried to dig the tooth out with their jack-knives, and pry it off, and what I suffered under their manipulation no man can tell. It was furious. One day they suggested that I put some acid in it that they used in testing rock, and I tried that, and it eased it for a few hours, when it began again with redoubled fury. If we had pincers we would have had it out, but I decided it no go, and I had to give in and look forward to tramping to Austin.

"On the morning of my leaving I found a man who was going up with a pair of cattle and a pair of wheels. I went along with him, sick and weak from lack of sleep. It was one hundred and fifty miles to Austin—five days and nights of travel. For five days and nights I suffered. I walked most of the time, rode some on the wheels; slept at night on the earth with a pile of sand scooped up for a pillow; had awful dreams; was exhausted by pain and worn to the bone. At last I struck Austin. Despairingly I hunted for a dentist. There was none. Finally I found a doctor who had an old pair of tooth-pincers. He set me down on a soap-box in a grocery store, and he went for me; and, after two hours of agony, he pulled that tooth from its socket, and I rose for the first time in many days happy in relief. Since then I have never looked a dentist in the face without thanking God for their dispensation, and that I am surrounded by them."

—*Lewiston Journal.*

A TALL dutchman, having an aldermanic stomach, visited a Brooklyn dentist with his wife, a small, wiry woman, when the following interesting oral performance took place:

"I fotch mine man to you, dentiss," she said, "to hav a toof pull't; he do noddings but holler und make troubles mit the children, und proke tings fur so long dot I can't think."

"Dot vhos so," interjected the dutchman, meekly.

"Und he told me lass nite dot he hav dose toof pull't uf it proke every pone in his poddies, und I vhos a vidder fur tousands of yeers, und more ish dot."

"Dot vhos so, Katherenee," said he.

"So dot I prings him to you, dentiss," she continued, "und I hopes you took out dot toof, und I pay fur dose shob mineself."

"Mine frow, she pays dose pills, dot vhos so, too," he said.

"All right," exclaimed the amused dentist, "take this seat," beckoning to the man with prodigious stomach, "and I will get you out of your trouble quickly."

"It no more ake me alredty," said he, getting hesitatingly on his pins, "und maype you puts somedings in it so dot I don't hav it out."

"You peas a grate pig koward vhot I vhos shamed to go mit you," she said, angrily. Then turning to the dentist she continued, "He make me much onhabbiness mit diss pishness when he hav dere ake in dot toof, und lass nite he spill mine tishes und proke mine klock, und he spank mine paby so dot it cry like ainydings, und I tink it vas ted."

"Dot vhos so, Katherenee," he said.

"Und if he don't hav dose toof ute I goes to my fadder, dots all," she said, with tears streaming down her cheeks.

"I vhill hav dot toof ute, Katherenee, when it vas akes somedings pooty quick, so help me Jemimee," he whimpered.

"Come, come," interrupted the dentist, "have the tooth out at once, and quit this nonsense."

"Vhot for I have dose toof ute when he no hurt me mit pain?" he asked. "I peas one grate pig fool to get mine shaws proke mit peeces so dot it no akes me enney more." Then addressing his wife, he added: "We goes rite home, Katherenee, und I no more proke ennytings, or spank dose paby, fur my akes am all sthöped so dot I don't feel more pains in mine poddies—dot vhos so, Katherenee."

And the twain departed.

"I can give you gas if you are afraid the pain will be too great to endure," said a dentist to an elderly colored woman who had come to have several teeth extracted. "No, sah; no, sah!" she said, shaking her head emphatically; "you don't gib me no gas an' hab me git up out'n dat cheer an' walk home dead; no, sah! I reads the newspapers."

TOOTH EXTRACTING EXTRAORDINARY.—Dr. Donogh, dentist, of 116 West Sixth street, Cincinnati, extracted recently, at one of the public institutions, one hundred and sixty-two teeth for fifty-two persons in two hours. Five were the most taken out for one person.

Editorial.

SEE THAT THE DETAILS OF YOUR WORK ARE PERFECT.

The reason we have not more real scholars, skilful practitioners and good writers in the dental profession, is because we have not more studious, painstaking, untiring workmen in the details in what is done. Don't be afraid of a little trouble, nor of much trouble, in perfecting the smallest "trifles." Your work, and studies, and efforts for skill, are made up of single acts, and to be successful there must be a distinct motive behind each. If that motive is not mature, and the muscles are not skilled to carry it out, there is defect that nothing can compensate. A man's work is only as strong and enduring as its weakest part.

So, when you would write for a public journal, throw aside all thoughts of trouble. Do your best in every respect, and it will prepare you for doing better in your next effort. When you have your thoughts fairly expressed, go over your production as critically and as severely as you would if it was your boy's composition. See if there are any words or sentences that are superfluous, or that might be profitably changed. Think of your subject in every detail, and as a whole, and see if some important thought can be added, or some side issue or irrelevant thought eliminated.

Not time for such work? We are none of us so busy as not to have time for the most important—and there is nothing more important than doing, as well as we can, everything we do; for it is not the number of things we do that makes us wise, skilful and successful, but the doing well everything we undertake to do.

This is the prime secret with our great men. It is not money and friends and fortuitous circumstances that have made them great and successful, so much as it is economizing the means they have, promptly improving every opportunity, and being thorough in everything they undertake. He is great who does perfectly what he has to do each day; and he is successful who builds well all the way up from the foundation.

SIMPLICITY IN LIVING.

It is not what we need that drains our purse and runs us into debt; it is not the healthy demands of our being that taxes our time and makes us slaves to our surroundings; it is not our necessary work and responsibilities that exhaust our energies. It is our superfluities that cost; it is our artificial appetites that enervate; it is our irregularities and dissipations that exhaust. We cannot catch pleasure by running after it; if we find it by searching, it soon slips through the fingers; it comes unbidden to the true life. We cannot buy healthy digestion, sweet rest and solid contentment. These spring up spontaneously from within, if the appetite is not pampered, if rest is not rudely disturbed by dissipation, and if contentment is not invaded by the horse-leach crying, "give! give!"

Our nature has not an appetite that was not given us to enjoy; not a faculty that we may not feel a pleasure in using; nor a passion that should not give exhilaration. It is their abuse that gives misery. In all these things we see the difference between love and lust. The latter is the former in unlawful or excessive use.

BRIDGET HAD THE TOOTHACHE.

The doctor, himself, gives us this amusing incident. She had it badly, and had it long. Yet she would not have the offending tooth removed. Though her master was a physician, and had the forceps. He had begged her, over and over again, to let him draw it, but she stubbornly refused.

And now, there she was again, her feet on the hot stove, her head buried in her lap, moaning and crying, and swaying to and fro like a great ship in a storm.

He had been a long way that night to see patients, and was tired. He wanted to go to bed, and could not be disturbed.

Going into his office, he took up the forceps he had so often laid down in disgust at her timidity, and sallied forth. "This time that tooth must come out, though it takes Bridget with it."

Going up quietly behind her, he stood up in a chair, and reaching over, he quickly brought her head between his legs; pried her mouth open, fastened his forceps, and gave a tremendous pull.

"Murther!—murther!!" cried Bridget. But in a twinkle the tooth was on the floor, and he and she, too; she and her chair backward by a mighty kick against the stove, and he forward over Bridget and her chair; but both in such a confused heap, it was hard to tell which was which. He had to defend himself against the stove, and she against his heels, and both against each other's weight. Each was mad, and yet both had to laugh at their ludicrous plight, as they disentangled themselves. But one thing was sure—that tooth was out.

OXYPHOSPHATE WITH GOLD OR AMALGAM.—Several years ago we called attention to the desirability, sometimes, of nearly filling a large cavity with oxyphosphate, and then, before this cement has set, pressing in crystal gold. This gold can be added to as the cement hardens, and thus the filling finished with gold. This is much cheaper than an all gold filling, and for frail walls better. A dentist called my attention to a similar practice by himself, that he considers quite an improvement in many instances on all gold. The oxyphosphate so thoroughly adheres to the walls that it makes, he thinks, a more durable filling than all gold. Capping a large oxyphosphate filling with amalgam is preferable to all amalgam for the same reason.

OUR QUESTION BOX.—We would like to enlarge the sphere of this department. To do so will our friends please ask any questions pertaining to dentistry they may desire light on, to Dr. E. N. Francis? Remember his address, Uvalde, Texas. We have engaged this gentleman as specially fitted for this work. Let us see if we cannot make this feature of the ITEMS interesting and profitable.

The verdict of the profession regarding Professor W. B. Mills is, "Well done, good and faithful servant."

Current Notes and Items.

Dr. Keys, of Rio Janerio is on his wedding tour to his home in Alabama. We hear of him as "a bright, promising dentist."

The *Dental Review* is booming. At the rate of its advances in dental literature, both in amount and merit, it will soon be the leading journal in the profession.

The University of California, Dental Department, has just closed a successful session. There were 33 matriculates, 63 students in attendance, and 16 graduations.

It is estimated that \$500,000 worth of gold is now annually put into the teeth of the American people. This fact is made the basis of the statement that our cemeteries will soon become gold mines.

Dr. Heitzman has returned from his visit to his fatherland, Germany. He is one of the leading microscopists of civilization. For several years he has had classes in New York, composed of advanced scholars; he also has junior classes.

DR. TEAGUE, of Aiken, South Carolina, has invented a unique sand-paper chuck. By means of this handy tool a rubber plate can be dressed and polished with little use of a scraper, and this only in corners and interstices. It is useful in polishing gold plate and especially gold cap crowns.

DENTAL ADVERTISING.—Dr. Ottolengui was taken to task at the last meeting of the First District Society, New York, for having written an article on implantation to the *New York Herald*. Dr. W. W. Walker believed it was a breach of the ethics of the society, and moved his case to a committee. What tender toes some dentists have, and how easily they are tread on.

Dr. J. H. DeWolf, 1600 Mulberry street, Baltimore, Md., is making efforts to organize a "Physicians' Protective Alliance," for the purpose of protecting physicians "from the abuses of dispensaries, quack graduations and inferior medical colleges, and to devise means to enhance the financial condition of physicians in every honorable way, and to derive the incalculable benefit that can only be obtained by combination." He solicits the name, with post-office stamp, of every physician who feels an interest in the subject.

A four-year-old son of Mr. and Mrs. Ernest Bohn, of Dubuque, Iowa, is a remarkable freak of nature. The child was born without eyes, and has no place for them, the forehead being perfectly smooth. The child is possessed of all his other faculties, and enjoys good health.

In cleaning teeth mix your pumice with a solution of Castile soap, instead of pure water. It cleans easier, leaving a smooth finish, without the burning of gums and lips, to say nothing of the more serious results of the aromatic sulphuric acid and glycerine preparation, used by so many dentists.

Dr. G. E. Stewart, Evereth, Pa., sends us a tooth resembling a temporary cuspid, which he says was extracted from the mouth of a lady aged thirty-five years, from whom he had extracted all the teeth in 1884, including large strong cuspids. He believes this is an instance of third dentition. What do others think?

Prof. H. S. Lowry, of the Western Dental College, has suffered the bereavement of his wife. The students of this college thoughtfully sent him the following resolution of condolence:

Resolved, That the students of the Western Dental College extend heartfelt sympathy to their highly esteemed teacher, Prof. Lowry, in this hour of deep affliction.

THE DENTAL MALLET.—Both the mechanical and the electric mallet undoubtedly originated with Dr. W. G. A. Bonwill, of Philadelphia, and they are a credit to his ingenuity. The first award of merit for his mechanical mallet was given the doctor in 1876 by the Franklin Institute. The next year he patented his electric mallet, though it was in use as early as 1869.

C. J. PETERS, D.D.S., has had considerable experience in the use of amalgam as an anchorage for gold. "It is useful," he thinks, "in teeth having very shallow cavities, and in cases where, while it is desirable to use gold, the edges chip or scale off at every attempt to make the cavity retentive." The doctor's method is as follows: "The cavity being ready, a small amount of cement is mixed and placed in it; on this put a cylinder of gold large enough to cover the floor of the cavity. Then work the gold into the cement, at the same time working the latter all over the cavity. Now, trim cement from the edges, and proceed with the filling, making a mechanical anchorage of the gold with that anchored by the cement." Rubber dam should always be used.

PROF. J. M. HIRSH, a German chemist, of Chicago, in an interview recently, claims that he has discovered a process by which he can extract aluminum from common clay, at a cost of fifteen cents or less per pound. Two six-story buildings have been leased by him, in which he proposes to begin work within a few weeks, turning out three hundred pounds daily from the start.

THE PROSECUTOR PROSECUTED.—An amusing story is told of a young dental graduate in Wyoming county, New York, who prosecuted a carriage painter that turned dentist. The grand jury not only acquitted the painter, but brought in a true bill against the young dentist for malicious prosecution. He was glad to seek terms of compromise. But two things he learned thoroughly, the obtuseness of juries, and the uncertainties of law.

Dr. S. A. Main, a dentist of Fifth avenue, New York, is a rising dentist—financially, at least. He is called the “millionaire” dentist of the metropolis: He is the only one in America we have heard of who supports a carriage and livery. He is no doubt a skilful operator; but there are many skilful dentists who are not millionaires. We are not sure but “his very genial appearance and pleasant manners” have much to do with his phenomenal success.

The origin of the first dental engine is the subject of some discussion. It would seem from all the testimony within our reach that Dr. W. G. A. Bonwill should have the honor of presenting the first dental engine to the dental profession. This was in 1869. If any one knows of any other dental engine of prior claim we should like to give it publicity. This engine has several times been improved, but it was left to 1890 to give it its best features. None can see and use it without admiring it.

There are some ignoramus jacks among physicians, as well as among dentists. *The Medical Gazette* alleges that the following letter was received by a physician from a man whom he knew, practising medicine and desiring counsel:

“dear Dock I have a pashunt whose physical sines shows that the windpipe has ulcerated off and his lungs have dropped down into his stomach I have given hym every thin without efect his fother is wealthy honorable influenshal as he is member of assembly and god nose i dont want to loss hym what shall i do ans by return male. Your frat.”

Jacob Johnson, M.D.

Miscellaneous.

ALCOHOL IN PATENT MEDICINES.

In the report on nostrums, proprietary medicines, and new drugs, which was read before the American Association for the Cure of Inebriates, is found in the appendix the following list of the results of the analysis of a large number of well-known patent medicines, which is of interest not only to the physician, but to the student of human nature, in view of the readiness with which charlatanism can hoodwink persons who on other subjects are supposed to have the ordinary quantity of common sense:

	PER CENT OF ALCOHOL.
Dr. Buckland's Scotch Oats Essence.....	35.
(Also $\frac{1}{4}$ gr. morphine to the ounce.) A more insidious and dangerous fraud can scarcely be imagined, especially when administered as this is recommended, for the cure of inebriety or the opium habit.	
The "Best" Tonic	7 6
Carter's Physical Extract.....	22.
Hooker's Wigwam Tonic.....	20.7
Hoofland's German Tonic.....	29.3
Hop Tonic.....	7.
Howe's Arabian Tonic. "Not a rum drink".....	13 2
Jackson's Golden Seal Tonic.....	19 6
Liebig Co.'s Coca Beef Tonic.....	23 2
Mensman's Peptonized Beef Tonic.....	16.5
Parker's Tonic.....	41.6
"A purely vegetable extract. Stimulus to the body without intoxicating. Inebriates struggling to reform will find its tonic and sustaining influence on the nervous system a great help to their efforts."	
Schenck's Seaweed Tonic.....	19.5
"Distilled from seaweed after the same manner as Jamaica spirits is from sugar-cane. It is therefore entirely harmless, and free from the injurious properties of corn and rye whisky."	
Atwood's Quinine Tonic Bitters.....	29.2
L. F. Atwood's Jaundice Bitters.....	22.3
Moses Atwood's Jaundice Bitters.....	17.1
H. Baxter's Mandrake Bitters.....	16.5
Boker's Stomach Bitters.....	42.6
Brown's Iron Bitters.....	19.7
"Perfectly harmless. Not a substitute for whisky."	
Burdock Blood Bitters.....	25.2
Carter's Scotch Bitters.....	17.6
Colton's Bitters.....	27.1
Copp's White Mountain Bitters.....	6.
"Not an alcoholic beverage."	
Drake's Plantation Bitters.....	33.2
Flint's Quaker Bitters.....	21.4
Goodhue's Bitters.....	16.1
Hartshorn's Bitters.....	22.2
Hoofland's German Bitters.....	25.6
"Entirely vegetable and free from alcoholic stimulants."	
Hop Bitters.....	12.
Hostetter's Stomach Bitters.....	44.3

Kaufmann's Sulphur Bitters.....	20.5
"Contains no alcohol." (In fact, it contains no sulphur, but 20.5 per cent alcohol.)	
Kingsley's Iron Tonic.....	14.9
Langley's Bitters.....	18.1
Liverpool's Mexican Tonic Bitters.....	22.4
Pierce's Indian Restorative Bitters.....	6.1
Porter's Z. Stomach Bitters.....	27.9
Rush's Bitters.....	35.
Richardson's, Dr., Concentrated Sherry Wine Bitters.....	47.5
"Three times daily or when there is sensation of weakness or uneasiness at the stomach."	
Secor's Cinchona Bitters.....	13.1
Shony's German Bitters.....	21.5
Sweet's, Job, Strengthening Bitters.....	29.
Thurston's Old Continental Bitters.....	11.4
Walker's Vinegar Bitters.....	6.1
"Free from all alcoholic stimulants. Contains no spirit."	
Warner's Safe Tonic Bitters.....	35.7
Warren's Bilious Bitters.....	21.5
Wheeler's Tonic Sherry Wine Bitters.....	18.8
Wheat Bitters.....	13.6
Whitcomb's, Faith, Nerve Bitters.....	20.3
Williams, Dr., Vegetable Jaundice Bitters.....	18.5

—*Weekly Medical Review.*

THE MANNESMAN TUBE.

Among the manufactures brought to notice at the International Meeting of Mining Engineers held recently at Pittsburg, Pa., that of the Mannesman seamless tube was equal to any in importance, and surpassing all in novelty. In the process of manufacture, and the results in the physical characteristics of the manipulated metal, there is originality in the one and a surprise in the other.

These Mannesman tubes are seamless and can be made to any diameter, from the spare dimensions of a string-like wire to over 95 per cent of the area of circumference. They are made from solid blocks of ingot metal, by external working only, and without the application of an internal mandrel or any other tool, and are of such tensile strength as to be able to stand a pressure of 3,000 pounds to the square inch. As a departure from all previous methods of manufacture, and resulting in a product of undeniably merit, it is calculated not only to work a revolution in methods with the iron-master, but by its peculiar qualities to largely replace other metallic products in the diversified uses of iron and steel.

The process consists in feeding a solid heated bar of ingot metal between rolls, which, while their axis are oblique to the axis of revolution, revolve both in the same direction. The metal of the surface of the bar—this acquires an increased motion in a spiral direction, and is drawn over its core, receiving consequently the form of a pipe. Since, in this operation the pipe moves spirally forward, and all its parts are spirally pushed and pressed, the metal becomes still denser. It is this spiral arrangement of the metal which makes the Mannesman pipes so remarkable, quite apart from the advantage they possess in presenting no lines of welding. The blow holes invariably present in ingot iron are squeezed out spirally, so as to make the

walls of the pipe completely impermeable. Hydrogen has been retained for weeks in a piece of Mannesman pipe closed at both ends, it being absolutely non-porous, all waste or absorption is positively impossible. The spiral direction of the fibres of the metal explains the great strength and the impervious density of the completed tube.

Among the samples on exhibition at Pittsburg some had been partially broken in two to show the forming of the tube on the one hand and the massive block of metal used in its construction on the other. Other samples illustrate the working of a mandrel in its application for smoothing the crystalline inner sides of the pipe; a series of these specimens conclusively proving that the tubes can be turned out in any desired dimension. Specimens were on exhibition of three and four-inch tubes, of which thirty miles of each size have been furnished for a South American water main. Of the four-inch pipes a petroleum residue conduit fifteen English miles in length has been furnished for the Caucasian district, the oil to be pumped a height of 3,000 feet to the top of a mountain, every piece of the pipe having been tested to withstand a pressure of 2,500 pounds to the square inch. The hammered samples of these tubes are evidence of elasticity and adaptability for use without separate connecting pieces, it being comparatively easy to join the tubes themselves. Some of these tubes have been turned inside out, and then doubled up, showing that the quality of the steel had been improved to a degree never before attained in any tubular article.

The diameter of some sample pieces had been increased three-fold by forcing a conic wedge into their ends, without using outside pressure, this equaling a tensile elongation by traction to three times the original length. Samples with a thin wall ($1\frac{1}{2}$ inches) had been bent into loops and intertwined without detriment to the pipe, making it easy to convert them into any desired shape or form for constructive purposes.

The practical uses to which this peculiar product can be applied are multiform and varied. It has been used as a calico printing roller, the ends serving as axis, reduced by hammering to one-sixth the diameter of the tube itself. Hollow chains, turnbuckles, bits, bells and engine cylinders have been turned into their respective forms with comparatively small labor from Mannesman tubes. As conduits for the transmission of compressed air power, and for gas and petroleum mains they are in economy and safety far ahead of other material, and as carbonic acid reservoirs, though but half the ordinary weight of reservoirs used for this purpose, they have been tested up to 300 atmospheres, and can be furnished to withstand a test of 16,000 pounds per square inch. With this pipe tube transmission of gas is possible from the coal mines where it could be manufactured, without the cost of coal freightage by railway transportation. In bridge construction the thin-walled, weldless steel tube of large diameter and great length permits the building of longer and more economical bridges, as well as of spans of greater length than has hitherto been possible.

The possibility of turning out Mannesman tubes in any desired form, circular or otherwise, is a new and interesting factor in the

utilization of steel, and adds to the working material of the constructing engineer. The tube axle for railway cars, combining lightness and safety is possible with the Mannesman process, and there is practically a limitless field for its adoption and service. At present there are but four manufactories of these tubes, and these in Europe ; the works in operation being located one at Remschied, Germany ; one in Bohemia, a small plant at Bous, Germany, and works at Landore, Wales, operated by the Mannesman Tube Rolling Company. A German-Austrian company has been recently incorporated and arrangements are being perfected for an American manufacture of this unique and remarkable product.

—*The Age of Steel.*

THE IMMENSITY OF SPACE.—A writer in *Nature* says :

For a long period astronomers unsuccessfully endeavored to determine the distance between the stars and the earth, and it is only within a comparatively short time that the interesting problem can be said to have been solved. The distance which separates us from the nearest star is, according to a recent lecture by Prof. Nichols, about 206,000 times greater than the distance from the earth to the sun, or 95,000,000 of miles multiplied by 206,000. Alpha, in the constellation of the Centaur, is the star nearest the earth ; its light occupies three whole years in traversing the distance which separates us from the little blinking orb ; or, in other words, should Alpha be blotted out of existence to-day, we would be well into the summer of 1893 before the inhabitants of this mundane sphere would be aware that Alpha no longer existed. Yet light travels so rapidly as to occupy no perceptible space of time in flashing around our globe. If the sun were transported to the place occupied by this, the nearest star, the vast circular disk, which in morning rises majestically above the horizon, and in evening occupies a considerable time in descending entirely below the same line, would have dimensions puny in their insignificance. Colossal as the sun appears to us, it would, were it possible for it to exchange positions with Alpha, take the Lick telescope to make it appear as a star of the third magnitude.

WASTE OF ENERGY.—It is held that even the very best steam engines lose 90 per cent. of the heat generated in their furnaces, and it has also been shown that in the incandescent electric lamp only 5 per cent. of the electricity consumed is converted into light, the rest being lost in heat. So it is not so much the problem of the scientists to discover new forces, perhaps, as to invent some way of reducing the waste that takes place in usage of those we have. When perfect combustion of fuel is accomplished, and when electricity can be quickened into light without the intermediation of heat, then, if we have not reached the millenium, we may look for other forces to subjugate. So it is in our physical and mental forces ; we do not need new forces so much as a judicious use of those we possess.

—*Electric Age.*

CAYENNE PEPPER blown into the cracks where ants congregate will drive them away. The same remedy is also good for mice.

—*Exchange.*